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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 167

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PRESS REPORT ON TARAPUR FUEL TALKS WITH FRANCE

Talks Open in New Delhi

Calcutta THE STATESMAN in English 7 Sep 82 p 1

[Text]

NEW DELHI, Sept. 6.—Talks began here today between a visiting French delegation headed by a senior member of the French Foreign Ministry, Mr Jacques Andreani, and an Indian delegation headed by the chairman of the Atomic Energy Commission, Dr Homi N. Sethna, on the supply of fuel for the Tarapur atomic power station.

An External Affairs Ministry spokesman said the talks were being held in an atmosphere of great cordiality and understanding.

Mr Andreani, who is the Secretary for Political Affairs in the French Foreign Ministry, is the third-ranking member in that Ministry, after the Foreign Minister and the Foreign Secretary.

The other two members of the French delegation are: Mr Louis Amigues, who deals with nuclear issues in the Foreign Ministry, and Mr Petit, a senior functionary of Cogema, a subsidiary of the French Atomic Energy Commission handling the export of nuclear material and equipment.

It was not clear who else were in the Indian delegation, besides Dr Sethna, at today's talks.

Although the official spokesman gave little information other than that the talks had begun, it is presumed that the talks were on settling the differences that had arisen over the French terms of supply of low-enriched uranium. The differences are said to relate to three elements in the draft agreement that France had sent India: the pursuit clause, the perpetuity clause and the proposal for a trilateral agreement between India, France and the International Atomic Energy Agency on safeguards.

Apparently, the scope of the pursuit and perpetuity clauses in that draft is larger than in the original Indo-U.S. agreement of 1963. Since, under the accord reached with the USA, the French sale of low-enriched uranium for Tarapur was to be within the framework of the 1963 agreement, India is naturally not agreeable to anything not in that original agreement. Also, since India already has a trilateral agreement on IAEA safeguards for Tarapur, it does not think a fresh agreement is indicated for supply of French fuel.

The French view seems to be that the terms of its eight-point draft agreement were nothing new, that they were indeed routine in all such deeds, and that in any case, the differences over them could be discussed and settled, as proved by the arrival of the delegation headed by Mr Andreani. South Block also evidently feels the same way.

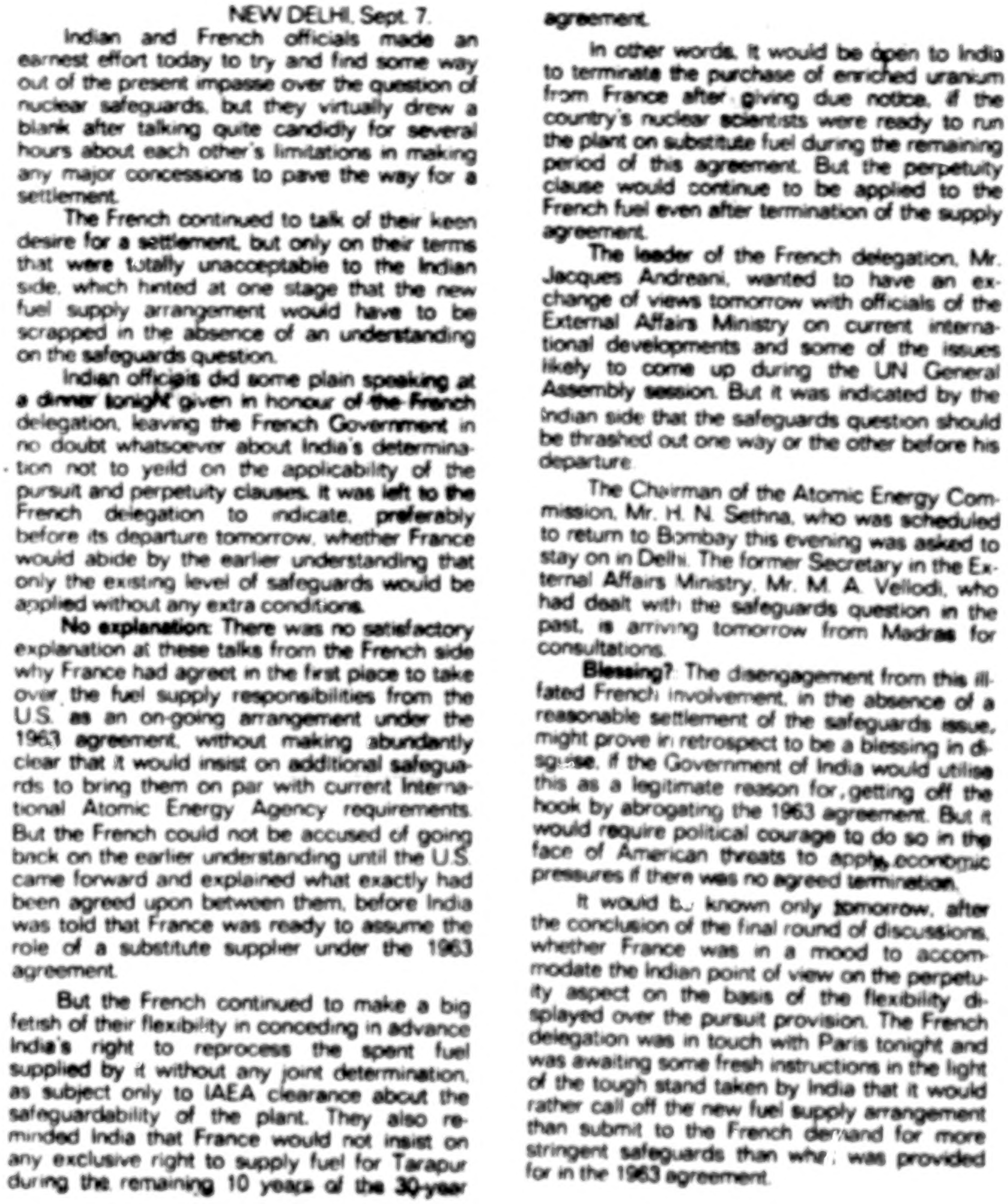
One view heard today was that under the Indo-U.S. accord over the Tarapur fuel, announced during the Prime Minister's visit to the USA, that country was to arrange for its replacement by France as supplier of fuel for the power station within the framework of the 1963 agreement, that the USA was bound to carry out that accord, and that the current controversy over French terms of supply was needless and apparently engineered by elements unhappy over Mrs Gandhi's successful U.S. visit.

First Day of Talks

Madras THE HINDU in English 8 Sep 82 p 1

[Article by G. K. Reddy]

[Text]



NEW DELHI, Sept. 7.

Indian and French officials made an earnest effort today to try and find some way out of the present impasse over the question of nuclear safeguards, but they virtually drew a blank after talking quite candidly for several hours about each other's limitations in making any major concessions to pave the way for a settlement.

The French continued to talk of their keen desire for a settlement, but only on their terms that were totally unacceptable to the Indian side, which hinted at one stage that the new fuel supply arrangement would have to be scrapped in the absence of an understanding on the safeguards question.

Indian officials did some plain speaking at a dinner tonight given in honour of the French delegation, leaving the French Government in no doubt whatsoever about India's determination not to yeild on the applicability of the pursuit and perpetuity clauses. It was left to the French delegation to indicate, preferably before its departure tomorrow, whether France would abide by the earlier understanding that only the existing level of safeguards would be applied without any extra conditions.

No explanation: There was no satisfactory explanation at these talks from the French side why France had agreet in the first place to take over the fuel supply responsibilities from the U.S. as an on-going arrangement under the 1963 agreement, without making abundantly clear that it would insist on additional safeguards to bring them on par with current International Atomic Energy Agency requirements. But the French could not be accused of going back on the earlier understanding until the U.S. came forward and explained what exactly had been agreed upon between them, before India was told that France was ready to assume the role of a substitute supplier under the 1963 agreement.

But the French continued to make a big fetish of their flexibility in conceding in advance India's right to reprocess the spent fuel supplied by it without any joint determination, as subject only to IAEA clearance about the safeguardability of the plant. They also reminded India that France would not insist on any exclusive right to supply fuel for Tarapur during the remaining 10 years of the 30-year agreement.

In other words, it would be open to India to terminate the purchase of enriched uranium from France after giving due notice, if the country's nuclear scientists were ready to run the plant on substitute fuel during the remaining period of this agreement. But the perpetuity clause would continue to be applied to the French fuel even after termination of the supply agreement.

The leader of the French delegation, Mr. Jacques Andreani, wanted to have an exchange of views tomorrow with officials of the External Affairs Ministry on current international developments and some of the issues likely to come up during the UN General Assembly session. But it was indicated by the Indian side that the safeguards question should be thrashed out one way or the other before his departure.

The Chairman of the Atomic Energy Commission, Mr. H. N. Sethna, who was scheduled to return to Bombay this evening was asked to stay on in Delhi. The former Secretary in the External Affairs Ministry, Mr. M. A. Vellodi, who had dealt with the safeguards question in the past, is arriving tomorrow from Madras for consultations.

Blessing? The disengagement from this ill-fated French involvement, in the absence of a reasonable settlement of the safeguards issue, might prove in retrospect to be a blessing in disguise, if the Government of India would utilise this as a legitimate reason for getting off the hook by abrogating the 1963 agreement. But it would require political courage to do so in the face of American threats to apply economic pressures if there was no agreed termination.

It would be known only tomorrow, after the conclusion of the final round of discussions, whether France was in a mood to accommodate the Indian point of view on the perpetuity aspect on the basis of the flexibility displayed over the pursuit provision. The French delegation was in touch with Paris tonight and was awaiting some fresh instructions in the light of the tough stand taken by India that it would rather call off the new fuel supply arrangement than submit to the French demand for more stringent safeguards than what was provided for in the 1963 agreement.

No Accord Reached

Calcutta THE STATESMAN in English 9 Sep 82 p 1

[Text] NEW DELHI, Sept. 8--The three-day Indo-French talks on the scope of International Atomic Energy Agency safeguards that should apply to the Tarapur power plant ended today without any apparent agreement, reports PTI.

Our Special Representative in New Delhi adds: The two delegations, headed by Mr Jacques Andreani and Mr Homi Sethna, respectively, decided to report on the talks to their Governments.

The External Affairs Ministry spokesman who briefed the Press on the talks said that "both clarified, to each other, their respective positions". The talks, were held "in an atmosphere of great cordiality and understanding"

The spokesman would say little more. His standard answer to all questions was that he was not authorized to say anything further beyond the brief five-sentence statement he read.

He, however, made on significant point, by implication. The two delegations, he said, had discussed the question of supply, "by France in lieu of the USA", of fuel for the Tarapur plant.

In other words, the supply was to be within the framework of the original agreement of 1963 relating to Tarapur and India would not accept any stipulation outside the terms of that agreement: neither the pursuit and perpetuity clauses reportedly included in the French draft sale deed nor its suggestion for a fresh trilateral agreement among India, France and the IAEA safeguards for the material supplied to Tarapur.

These, clearly, were "the various aspects to the question" which the two delegations discussed, according to the spokesman.

India having thus made its position clear, the French delegation which was political in character (Mr Andreani heads the Political Affairs Division in the French Foreign Ministry) will now report back to the French Government on India's objections to the draft sale deed sent last month.

That the Indian delegation at the talks was headed by the chairman of the Atomic Energy Commission, Mr Sethna, is considered significant. Unlike the non-technical officials who participated in the earlier discussions with the USA on its replacement by France as fuel-supplier for Tarapur, the AEC chairman has a clear idea of the likely consequences of acceptance of the French terms of supply, with their reportedly sweeping "safeguards" provisions.

One gathers the impression that the French will not be unwilling to alter the terms of supply--rephrasing them so as to make implict what is now explicit, as a French source said--in the interests of Indo-French relations which right now are very good.

Also, they are not exactly anxious to foul the atmosphere, with several important visits to India due by French leaders. That country's Minister for External trade as well as its Defence Minister are scheduled to visit India early next month. President Mitterand is coming towards the end of November.

The French delegation left for Paris this evening, add PTI and UNI.

Diplomatic sources said the views expressed by the Indian side would be conveyed by the French team to Mr Mitterand.

Analyst on Talks' End

Madras THE HINDU in Eglish 9 Sep 82 p 1

[Article by G. K. Reddy]

[Text] NEW DELHI, Sept. 8--The Indo-French talks on Tarapur safeguards ended inconclusively today without any agreement, after three rounds of detailed discussions that did not lead to any narrowing down of the differences over the proposed application of the pursuit and perpetuity clauses.

A terse statement issued on behalf of the two delegations did not state specifically whether the inconclusive talks would be resumed at a later stage, other than saying that they would report back to their respective governments on the outcome of these discussions--and remain in touch with each other, presumably for a further exchange of views on the subject.

The statement said: "The two sides discussed the various aspects of the question. Both sides clarified to each other their respective positions. The talks were held in an atmosphere of great cordiality and understanding. The two delegations will report on these discussions to their respective authorities. The two sides will be in touch with each other."

Clumsy Language

The clumsiness of the language of this statement clearly reflected the confusion that prevailed at these talks, with both sides taking diametrically opposite positions on the twin issues of pursuit and perpetuity, with no meeting ground at all on either of them. The attempt to conceal the discord and blur the persisting differences by resort to inane expressions could not hide the reality that the talks had ended in a stalemate with little hope of mutual accommodation.

Faith Shaken

The French are, no doubt, under pressure to make a fresh attempt at a higher political level to resolve this problem well before the visit of President Mitterrand to India in November by dispelling the sour note that has crept into Indo-French relations. But whatever the outcome of this controversy, Indian faith in the durability of the French connection has unfortunately been undermined by this sad episode.

The Indian and French delegations concluded the current round of talks with the feeling that there was bound to be another round soon, although the possibility was not spelt out in the joint statement. But the dialogue would be fruitful only if it was resumed at a higher level, with a firm determination to find a solution to the safeguards issue in the larger interests of Indo-French relations.

The U.S. continued to adopt a wait and watch attitude, making no positive contribution to an early resolution of these differences. But it was being kept in touch by both sides with the different formulations that were being discussed for finding a mutually acceptable way out of the controversy over the applicability of the pursuit and perpetuity provisions to the proposed French fuel supply under the 1963 agreement.

Rigidity, a Mystery

It is still a mystery to India why France has chosen to take this rigid stand after adopting a seemingly helpful attitude during the initial stages of the triangular exchanges behind the scenes, before the announcement was made of the alternative fuel supply arrangement during Mrs. Gandhi's visit to Washington. It is not prepared to accept the apologia that what has subsequently been made more explicit was quite implicit in the known French stand that the upgraded International Atomic Energy Agency safeguards will be automatically applied to all its new nuclear transactions.

The next act of this astonishing melodrama will be renewed exchanges between India and the U.S. to determine what exactly went wrong with the earlier understanding bringing France into the picture. But the U.S. seems to be in no great hurry to get India or France out of this predicament without scoring some point in its favour in the bargain.

Sethna to Meet French Counterpart

Madras THE HINDU in English 11 Sep 82 p 9

[Article by G. K. Reddy]

[Text] NEW DELHI, Sept. 10--There will be further exchanges between India and France on the question of nuclear safeguards when the Chairman of the Atomic Energy Commission, Mr. H. N. Sethna, meets his French counter-part, Mr. Pecqueur, in Vienna later this month during the International Atomic Energy Agency's annual conferences.

The two nuclear experts, who have known each other for many years, will be able to take informally a fresh look at the points of divergence even if they are unable to narrow down the differences at this stage.

But if they feel that it would be useful to have another round of talks for exploring the possibilities of mutual accommodation, Mr. Sethna might pay a visit to Paris later, along with some senior officials of the External Affairs Ministry to keep the dialogue going until the two Governments are ready to tackle the problem at the political level consistent with their respective positions.

Reasonable formulation: The leader of the French delegation, Mr. Jacques Andreani, was told quite clearly before he left Delhi that India would in no circumstances submit to the perpetuity clause, while it was ready to discuss and accept a reasonable formulation on the pursuit question reaffirming its commitment to keep the spent fuel and reprocessed plutonium at Tarapur itself in accordance with its understanding with the United States.

There will be some indication of the fall-back French position only after Mr. Sethna, has met Mr. Pecqueur in Vienna and probed his thinking on the perpetuity issue, the crucial point of contention. If the French are inclined to be somewhat flexible on this question, accepting in principle the basic Indian stand that all safeguards on the Tarapur plant and materials of U.S. and French origin must come to an end in 1993 with the conclusion of the 1963 agreement, it should be possible to devise a formula that would preclude any possibilities of the reprocessed French fuel being misused for any unauthorised purposes.

Barnes calls on Rasgotra: The U.S. Ambassador, Mr. Hary Barnes, who returned from this month-long home leave, called on the Foreign Secretary, Mr. M. K. Rasgotra, to discuss the difficulties that have arisen in implementing the recent Indo-American accord to induct France as fuel supplier within the framework of the 1963 agreement. But he had no explanation to offer why France had decided to press for additional safeguards after agreeing in principle to the earlier arrangement.

The French Ambassador, Mr. Andre Ross, who has also been away on home leave, will be back in Delhi by the middle of the month to start preparing for President Mitterrand's visit in November. He will probably come with some further clarifications of the French position to see whether the matter could be amicably settled, or got out of the way by scrapping the new arrangement before the French President's visit.

Meanwhile, the French Air Chief will be visiting India next month on the eve of the French Defence Minister's visit to finalise the mirage-2000 agreement and also discuss India's other defence requirements.

CSO: 5100/7162

DANGERS OF ADHERING TO TARAPUR FUEL PACT DISCUSSED

'THE HINDU' Editorial

Madras THE HINDU in English 8 Sep 82 p 8

[Editorial]

[Text] THE LATEST ROUND of negotiations with the French Government over the terms of fuel supply to the Tarapur atomic power station represents a misplaced search for a compromise on a matter in which no compromise is indicated at all in the national interest. One poorly conceived deal — the skeletal accord announced in Washington on the occasion of the Prime Minister's visit — is now in the process of leading to another, the details of which are likely to have an adverse long-term impact on the nuclear programme as well as on nuclear policy. To recall the relevant sequence of events. In the period following India's Peaceful Nuclear Experiment (May 1974), the U.S. failure to honour a solemnly entered into commitment to supply low-enriched uranium fuel to Tarapur until 1993 led to the breakdown of the bilateral nuclear relationship. Three rounds of negotiations in 1981 failed to resolve the deadlock. With the Indian delegation led by the Chairman of the Atomic Energy Commission, Mr. H. N. Sethna, holding firm to the basic policy postulates (on which the nuclear programme has been developed from the time of Bhabha), a tentative decision was conveyed to free Tarapur from the external constraints and safeguards instituted in a non-performing agreement and run it on indigenously developed mixed oxide fuel (mox). Faced with the prospect of a developing country scoring a significant triumph over its much-vaunted "non-proliferation" policy as well as over the discriminatory international environment, Washington let India face the prospect of economic action, starting with the guillotining of Exim bank credits. In this situation, France was introduced as an alternative supplier of fuel for Tarapur and the 1963 Indo-U.S. agreement for nuclear cooperation was proclaimed as the control framework for the new relationship. As soon as the ink was dry on the skeletal agreement, the U.S. signalled its intention to make reprocessing of India's spent fuel a knotty issue, notwithstanding a position taken in the negotiations that the objection to reprocessing would be given up as part of a package deal. Meanwhile, the French Government (through its Foreign Minister) appeared to make concessions to India in the matter of terms for the fuel supply by reaffirming the decision to stick to the 1963 agreement and by stating specifically that no attempt would be made to control India's reprocessing of the enriched uranium fuel to be supplied. When the fine print arrived through a diplomatic communication, the French interpretation of the deal surfaced in the form of a demand that India accede to key terms of the guidelines laid down by the London Suppliers' Club, which have been accepted by the International Atomic Energy Agency (IAEA) as the standardised terms for post-NPT nuclear supply relationships. There would be a "perpetuity" clause relating to safeguards (the 1963 agreement is a time-bound affair) and a full-fledged "pursuit" clause covering the derivative fissile material (this was not conceded by India in the original agreement). The compromise attempted in the current negotiations appears to be centred on these two items.

Now, the unorthodox arrangement sought to be concluded among the three governments is undesirable on several counts. To begin with, it would appear to confront the Indian nuclear programme with two nagging spouses instead of one. (Given the best of intentions on the side of Paris, the London Club rules of the game and the updated IAEA concepts which are in line with the global nuclear bargain incline it to a difficult stance.) From the standpoint of Indo-French political relations, it might introduce some source of live contention where there is none at present. With respect to the country's nuclear programme — which deserves unwavering backing at this juncture — the meaning of the "pursuit" clause should be fully understood. Not only will external safeguards and controls apply to the special nuclear material supplied by the member of the London Club. They will chase the derivative fissile material to any and every facility where it may be used; any special nuclear material produced subsequently through the use of this derivative material will also be pursued. Acceptance of the "perpetuity" clause for the short-term gain of a fresh source of fuel supply would transform the entire character of the 1963 relationship (which is quite liberal as nuclear relationships go). In short, acquiescence in the London Club guidelines would introduce the risk of a creeping regime of external restrictions or controls over the recipient country's range of nuclear facilities. Most unfortunately, the very conclusion of the deal with France would seem to undermine plans made by the nuclear scientific establishment to reprocess Tarapur spent fuel for peaceful use in the Kalpakkam test breeder facility. Finally, there is the impact on the work and morale of the scientists and technologists who have been warning against the uncertainties and the risks of a new arrangement for Tarapur that would be messy rather than helpful. We urge the Government of India to have confidence in the experts responsible for the development of the vital field and terminate the danger that the Indian nuclear programme might easily run into.

Amalendu Das Gupta Article

Calcutta THE STATESMAN in English 10 Sep 82 p 8

[Text] It used to be said of the British Government that it welcomed with all the honours due to Commonwealth Prime Ministers, Asian and African politicians whom it had regularly sent to prison. The paradox is even more ironic in the case of Sheikh Mohammed Abdullah who continued to draw tributes from Central and State leaders even during the 14 years of his life after Independence that were spent in detention of one kind or another. Taking into account Maharaja Hari Singh's reign, he must have been in captivity for nearly 16 years. But, of course, he had far more substantial claims to eminence as even his political detractors readily admitted. India would have been a smaller place, in terms of physical as well as moral dimension, without his decisive lead in 1947; nor would Jammu and Kashmir have been so firmly wedded to the secular creed that sustains national integrity. It can even be argued that Kashmir's tragic partition might have been avoided if he had not been in jail when the State was invaded.

The Sheikh sought no higher position for himself than to lead his State; and he certainly did not waver in his allegiance to Indian unity. But within that framework of loyalty he would brook no tampering with what he saw as Kashmir's inalienable rights under Article 370. It became an obsession with him even though circumstances had altered radically since the Instrument of Accession was signed, and effective authority in most matters had been transferred to the Centre through less formal means. The insistence on a legal formality was also exploited by Sheikh Abdullah's political opponents, lately including the Congress (I), to cast unworthy aspersion on his patriotism. He could survive their manoeuvres because of the personal respect he commanded. His tremendous prestige also enabled him to push through measures (the oath of loyalty for Ministers and National Conference MLAs removal of the Speaker, restrictive Press laws or the elevation of relatives to high positions) that were inherently reprehensible and would have provoked bitter opposition if attempted by a lesser man. And then his slackening hold is alleged to have encouraged widespread corruption and a variety of administrative abuses.

Dr Farooq Abdullah may have to bear the brunt of a delayed pubile and political reaction to these later developments. His appointment as acting Chief Minister was in accordance with his father's wishes, though hardly in consonance with respectable democratic usage. But since the new leader has nothing like the same claim on national or State esteem his tenure is likely to witness major qualitative changes. The National Conference cannot, for instance any longer hope to escape critical scrutiny. Whether or not Mr G. M. Shah, challenges his brother-in-law's inheritance, other Kashmiri politicians would be justified in expecting him to prove his credentials and demonstrate his party's ability to run a clean and efficient administration. But the real challenge will probably come from the Centre which may not permit in Dr Abduallah the degree of assertiveness that it tolerated from the Sheikh: Kashmir's relations with the rest of the country may soon have to be recast in a more normal frame.

Communist Newspaper Editorial

New Delhi PATRIOT in English 11 Sep 82 p 2

[Editorial]

[Text] FRANCE was amongst the important Western powers which refused to sign the Nuclear Non-proliferation Treaty. Generally De Gaule's France was acutely conscious of asserting its independence in such matters. But slowly and steadily, Paris got dragged into the international traps which circumscribed this independence. As its role as exporter of nuclear technology and material grew, France voluntarily accepted the rules laid down by the London Club. It is, however, to be hoped that on the question of supply of nuclear fuel Mitterrand's France will take a view which is consistent with the independent position proclaimed by it on important policy issues. The atmosphere of growing friendship between this country and France should not be fouled by unnecessary controversies over terms which India, it is known without doubt, will never accept. French negotiators should not try to probe this country's readiness to resist pressures on questions of pursuit and perpetuity. It will only generate an unhappy feeling at a time when this country is looking forward to President Mitterrand's visit, scheduled only a few weeks later.

It is now clear that our officials acted with undue haste in finalising the arrangement on supply of enriched uranium before the Prime Minister's U.S. visit. Many relevant questions which should have been asked and clarified were not addressed to concerned parties. The Political Affairs Committee of the Cabinet was rushed into endorsing the proposal that France should substitute the US as supplier of fuel. In the anxiety to project it as an evidence of success achieved during Mrs Gandhi's visit, the whole issue was dealt with somewhat amateurishly. However, the main task now is to ensure that the nuclear programme is continued without surrendering the basic positions that the country has taken so far on important issues of principle. While we should continue to try to secure fuel for Tarapur from external sources without compromising on terms and conditions which we refused to accept under U.S. pressure, it is time to accelerate our own efforts in this field.

Our commercial scale fast-breeder prototype is scheduled to be ready by 1985. This is expected to serve as the basis for the second generation of power reactors after 1990. For one 1000 MW. output reactor of this type we need nearly three tonnes of Plutonium-239 for the initial charging of the core. During a recent Rajya Sabha debate, the Prime Minister revealed that the country has 320 tonnes of spent fuel rods now in storage tanks. By subjecting these to reprocessing we can expect to get one to three tonnes of Pu-239, and the process will take more than two years. Should we not start reprocessing now? No doubt this will make Mr Reagan angry. But if the country does not face the reality now, not only its fast breeder programme but also the use of MOX technology for running Tarapur without imported enriched uranium will be undermined. This will also adversely affect the possibility of utilising our considerable Thorium deposits in Kerala for generating nuclear power. Already, all our programmes in the nuclear field are woefully behind schedule. Further procrastination may gravely jeopardise this vital sector of our development.

G. K. Reddy Analysis

Madras THE HINDU in English 12 Sep 82 p 2

[Article by G. K. Reddy]

[Text] THERE are few issues of national endeavour that have captured the imagination of the Indian elite so profoundly as the country's determination to resist the attempts of the nuclear powers to impose highly discriminatory safeguards in the name of non-proliferation. The firm resolve to assert the sovereign right to engage in legitimate research and development, to tame the atom and harness its energy for peaceful uses, has become an integral part of the Indian emotion.

It has cut across party politics and united the country in according greater priority to what is still a frontier science despite the insidious attempts of some big powers to decry the whole thing as an expensive showpiece that can hardly justify the diversion of scarce resources. Foreign propaganda that a poor country like India can ill afford to chase this mirage has made no impact, because what India has been spending on its nuclear programme is only a tiny fraction of what others continue to lavish on acquiring or exercising the nuclear option.

Crying wolf

The result is that those who are opposed to India's nuclear development have swung to the other extreme of crying wolf to create the scare that, in refusing to submit to stricter safeguards or self-imposed limitations, India in effect is setting a dangerous precedent for proliferation. The alleged risks involved in allowing a developing country to acquire a degree of nuclear self-reliance are cited as enough justification for stepping up pressures to compel India to forsake the aspiration in the larger interests of world peace.

It is in this context that the members of the London Suppliers Group have been trying to tighten progressively the safeguard provisions to the point of denying countries that refuse to comply voluntarily with these constraints the opportunity to proceed with their indigenous programmes.

No aspect of Indian policy has aroused the same degree of sneaking admiration or strong disapproval among the foreign diplomats in Delhi, depending on their political proclivities and power alignments, as the country's stand against this discrimintion. If India were to cave in, in the face of the mounting pressures, its prestige will suffer considerably in the eyes of the Third World, while the big powers themselves will have little respect for it. The French obduracy has left India with no alternative except to reject the demand for additional and more restrictive conditions even if it meant abandoning the new fuel arrangement.

Heavy price

The latest controversy has also focused attention, in the internal political context, on the pitfalls of a dichotomous approach to a matter of such fundamental importance. There is no logic in continuing to proclaim the virtues of self-reliance, while indirectly diluting the very principle of it on purely extraneous considerations.

In agreeing willy-nilly to keep the Tarapur accord alive, the Government in effect has sacrificed the option to run the plant with the indigenously developed mixed oxide. It is a heavy price that India has been called upon to pay to deny the U.S. the dubious distinction of going back on a solemn bilateral commitment on the basis of its domestic legislation.

In all such matters there has to be a clarity of purpose backed by a readiness to exercise the available choice for achieving the desired objective. India cannot afford to falter in charting out its course of action, if it has to assert itself decisively in the larger national interest. Any vacillation over fundamentals can be disastrous in dealing with big powers bent on exerting pressures to make other countries comply with their directions. A major handicap of Indian diplomacy in dealing with the U.S. and France over the nuclear issue has been the absence of a proper negotiating agency with the authority for discussing the political and technical aspects with full knowledge and self-assurance.

Big powers' doubts

The resistance that India encountered in the earlier stages of its nuclear programme related largely to the strong doubts voiced by the big powers about the need for atomic power by developing countries that were still in the cow dung age, besides the utter disbelief with which they reacted to what was widely regarded as India's over-ambitious plans to tap this new source of energy for its development. It took considerable effort on the part of the late Dr. Homi Bhabha to propagate the theme at various international conferences and carry some conviction that developing nations needed atomic power as much as the developed States for the intermediate stages of their development.

The whole Western attitude at that time was so very patronising that the big powers viewed the Indian nuclear programme as no more than a cottage industry at an embryonic level of development. In 1954 Britain offered to give some enriched uranium fuel elements on loan for a swimming pool type experimental reactor on condition that India built the rest of it which included civil works, design and construction of the tank, electronic controls and prepare for the operation entirely with local staff without outside assistance. It was supposed to be built in competition with the Lido type reactor already at Harwell in Britain.

Achievement

The challenge was accepted and the work was completed in the record time of one year at Trombay and, through trial and error, the Indian nuclear scientists mastered the technology of making the reactor critical under controlled conditions. It was the first nuclear reactor in Asia built and operated entirely by Indian staff except for the enriched uranium fuel given by Britain. It was a remarkable achievement by any standard for a developing nation which began with a modest programme of research only 10 years before to have done so to the great surprise of the big powers which thought it was well beyond India's ability at that time. The reactor which was named Apsara is still in operation at BARC for research purposes.

The second landmark was reached when Canada made a generous gift under the Colombo Plan of an NRX type reactor named Cirus which started functioning in 1960, a natural uranium and heavy water system that was subsequently adopted by India as standard technology for its future nuclear power programme. At that stage Bhabha seemed to favour the Dido type,an enriched uranium and heavy water combination that was in operation at Harwell and tested out successfully for Apsara but he subsequently veered round to the view that an NRX type was preferable, since India could not afford to get two high flux reactors of different designs and fuel systems going with its limited experience. Two more experimental reactors which were built entirely by India went into operation in 1961 and 1972 and a third one is under construction.

Pokhran test

The big powers became somewhat concerned when India built a plant at Trombay in 1964 to reprocess the spent fuel from Cirus which in theory gave India the nuclear option. The establishment of the Nuclear Fuel Complex in Hyderabad was followed by the construction of a big reprocessing plant at Tarapur, besides a chain of heavy water plants.

The West realised that India was steadily acquiring a degree of self-reliance that could make the country independent of any further foreign assistance. Then came the Pokhran test that set in motion the chain of subsequent developments culminating in the latest French insistence on more stringent safeguards and conditions on the fuel it has agreed to supply for Tarapur under the 1963 agreement.

India did not follow up the Pokhran experiment with further tests to complete the cycle of research and development for peaceful uses. The Janata Government did great harm in affecting the sense of direction and demoralising the nuclear scientists by abruptly halting or curtailing many of the research programmes. Once the momentum was disturbed it became extremely difficult to restore it fully in the face of mounting external pressures. What was essentially an exciting technological adventure got bogged down in a legal wrangle over the rights and obligations under different cooperation agreements.

The unfortunate part of it is that it was initially with the cooperation of France that India learnt a lot about reactor materials, reactor controls and neutron physics particularly with respect to natural uranium systems. It also offered to provide the highly enriched plutonium required for commencing the operation of the fast breeder experimental reactor at Kalpakkam, but subsequently backed out of the commitment.

The Indian scientists are reasonably confident of running the plant with another fuel combination with some design changes, but it would involve in one form or the other use of plutonium obtained from reprocessing which would raise political questions.

The Tarapur plutonium could not be used elsewhere so long as the 1963 agreement with the U.S. is in existence. The only other plutonium available is that obtained from reprocessing the spent fuel of Cirus which is not subject to any safeguards, but the depletion of this stock will impede the experimental work at Trombay.

Hobson's choice

India is thus faced with a Hobson's choice at almost every turn of the running controversy over safeguards and implied threats of economic sanctions. The critics have been pointing to the teething troubles at Tarapur and Rajasthan as evidence of India's inability to keep pace with its ambitious nuclear programme without outside assistance. The real challenge is political in the sense that the policy-makers need stronger nerves to be able to cope with the psychological warfare launched by the London Supply Group which incidentally includes the Soviet Union.

And the big powers which are prepared to turn a blind eye at the Israeli and South African bid to acquire nuclear capability have no right to moralise to India which has consciously abjured the right to make nuclear weapons. It is highly unlikely that France would have taken such a rigid stand without some sort of prodding and encouragement from some other members of the London Supply Group which have the monopoly of nuclear trade and have arrogated to themselves the authority to dictate terms to the rest of the world.

CSO: 5100/7163

OFFICIAL REAFFIRMS PEACEFUL PURPOSE OF NUCLEAR PROGRAM

Islamabad THE MUSLIM 24 Sep 82 p 3

[Text] ISLAMABAD, Sept. 23: Mr. Munir Ahmad Khan, Chairman Pakistan Atomic Energy Commission reiterated that introduction of nuclear power in Pakistan was essential to meet our growing electricity needs. This was particularly important in the present circumstances as we were spending about 60 per cent of our total foreign exchange earnings on the importation of oil he said.

Addressing the 26th annual session of the IAEA General Conference at Vienna the Chairman said that Pakistan was pursuing a peaceful programme of atomic energy consistent with its needs and limited resources. He said besides developing nuclear power, Pakistan was placing strong emphasis on application of nuclear techniques in agriculture, medicine and industry.

He said a comprehensive study undertaken in Pakistan has indicated that a number of nuclear power stations over the next two decades are required to meet a gap of 5000-8000 MW between projected supply and demand. He also stated that the basic infrastructure both in terms of industry manpower and nuclear fuel for the future development and introduction of nuclear power has already been set up due to the experience gained by the Commission in the fabrication of indigenous fuel for 137 MW Power station KANUPP located a Karachi. Underlining the economic aspect of nuclear power generation the chairman, said that under our conditions, a standard nuclear power station will produce electricity more economically as compared to an equivalent oil-fired power plant. He mentioned that Pakistan approved the setting up of a 900 MW light water nuclear power reactor scheduled to be commissioned by 1989 which would be a major breakthrough in the field of nuclear power generation in this country. This reactor, like KANUPP, will operate under IAEA Safeguards, he added.

NON -PROLIFERATION

Munir Ahmad Khan said that in order to ensure a constructive role by nuclear energy it was essential to eliminate threat of further proliferation of nuclear weapons both horizontal and vertical.

He regretted that usually efforts have been made to check the horizontal proliferation while vertical proliferation was ignored. Conservative estimates have indicated the existence of more than 50,000 nuclear warheads which can be unleased at a moment's notice against which there was no defence.

He said that nuclear weapons will not enhance the security of small or less developed countries. Therefore, Pakistan was firmly committed to policy of non-proliferation of nuclear weapons.

He reiterated the Pakistani proposal for the establishment of a nuclear free zone in South Asia to check the production and introduction of nuclear weapons in this region. Expressing his strong faith in peaceful application of nuclear power, the Chairman said that a billion of people living in poverty in our region could not afford the luxury of nuclear weapons at the expense of basic necessities of life.

He, however, clarified that the cause of non-proliferation could not be advanced by pursuing the short sighted policies of denial of peaceful nuclear technology, imposition of restrictions on sharing of nuclear power know-how and equipment through so-called technical fixes.

REPRESENTATION

Strongly advocating the cause of more Third World representation in the IAEA Board of Governors, Mr. Munir Ahmad Khan stressed to resolve this question without further delay to bring justice to the under-represented areas of Africa, Middle East and South Asia. He referred to a compromise formula of a modest increase of one seat each for Africa and Middle East.

CSO: 5100/4301

PAKISTAN'S NUCLEAR CAPABILITIES DISCUSSED

London AL-DUSTUR in Arabic No 251, 13 Sep 82 p 34

[Text] After the Soviet invasion of Afghanistan, the Americans promised to supply Pakistan with various kinds of arms, including F-16 bombers, in order to kill two birds with one stone: strengthen Pakistani forces against a possible Soviet threat and divert the Pakistani government from requesting the nuclear weapon. However, it appears Pakistan did not renounce its nuclear ambitions by accepting the conventional American arms.

The American government warned that the American arms deal valued at $3.2 billion dollars would be suspended if Pakistan insisted on carrying out nuclear tests. But General Zia-ul-Haq's rejection of the warning reflected something more than pure stubbornness or defiance, for Pakistan has given the highest priority to its nuclear projects to the point where it has become difficult to retreat. It has two nuclear projects under way and the competition between them is fierce.

In the Kahuta nuclear plant near Islamabad, a Pakistani team headed by 'Abd al-Salam Khan is trying to enrich uranium. The plant is believed to be striving to conduct nuclear tests using enriched uranium. The apparatus and equipment of the plants have been purchased from a number of European and American countries.

The second nuclear project in Pakistan is under the supervision of the Pakistani Atomic Energy Commission (PAEC). In the 1970's, the Pakistani government tried to buy a plant from France for extracting plutonium from fuel used in the reactor. Because of the pressure exerted by the American government and President Carter, France was forced to withdraw from the agreement. But the PAEC is believed to be itself directing the laboratories now extracting the plutonium.

However, the KANUPP reactor, which is managed by the PAEC, is subject to inspection by the International Atomic Energy Agency (IAEA). Early this year Hans Balchs, director-general of the agency, said negotiations between the Pakistani government and the agency concerning improvement of the inspection staff for the KANUPP reactor made no progress. The PAEC says most of the suggestions of the IAEA were agreed to, but the agency is not yet convinced. Its previous announcements revealed great anxiety about the dangers of converting plutonium.

The problem is the first Pakistani reactor Kahuta is supervised by the Organization of Special Operations. This organization is under the jurisdiction of the Pakistani Army and is now headed by General Chaudhry Habib Zaman. Therefore, any attempt by President Zia-ul-Haq to reduce the role of the Kahuta reactor at the expense of the KANUPP reactor will impair its relations with the army.

Munir Ahmad Khan, chairman of the PAEC, announced that Pakistan will invite foreign countries to participate in the construction of a large nuclear plant in the Chashma region in the Panjab district southwest of Islamabad. The Chashma plant will require enriched uranium equipment from foreign governments. However, President Zia-ul-Haq subsequently spoke about Pakistan's ability to enrich uranium in the Chashma plant.

This self-sufficiency and ability to do without foreign equipment may ultimately free Pakistan from international supervision, although President Zia-ul-Haq keeps saying Pakistan does not have any intentions of producing nuclear weapons either for itself or for any other allied Muslim state. But India is closely observing Pakistan's nuclear projects. In her recent visit to Washington, India's Prime Minister Gandhi complained of the dangers of the Pakistani nuclear development. Also, the Israeli intelligence service was charged in recent years with setting off several explosions in European installations and attacking businessmen with any nuclear ties to the Pakistani government.

A few months ago, Pakistani Minister of Foreign Affairs Agha Shahi declared that his government will, if circumstances require, carry out several nuclear tests despite American warnings. This may create an obstacle to the American arms deal.

5214
CSO: 5100/4303

CONCEPT OF ADVANTAGEOUS NUCLEAR WAR STRONGLY CONDEMNED

Rawalpindi TAMEER in Urdu 19 Aug 82 p 2 & 3

[Editorial: "The Dream of Winning a Nuclear War"]

[Text] The American Defense Department has prepared a new plan which, when completed, they are sure will make it possible for America to win a nuclear war against the Soviet Union. Of the trillions of dollars which will be spent on aspects of its military expenditures and defense arrangements, $1.9 billion will be spent just on arrangements to ensure the continuity of the system.

On the question of whether or not anyone can win a nuclear war, it is the unanimous opinion of the experts that neither America nor the Soviet Union could do so. But let us say that after a decade America is able to win such a war. Even the expenditures necessary for this would be frightful; then the destruction which would result, the loss of human life, the way industries, cities and the centers of culture and civilization which have come into existence after centuries of human labor would be faced with destruction, cannot even be conceptualized. If by thrusting some 50,000,000 or 100,000,000 of its citizens into the mouth of death and enduring the destruction of half its buildings in some nuclear war, America should be successful in killing 100,000,000 or 150,000,000 Soviets and destroying three-fourths of the country, and if those few souls remaining should have the right to call themselves victorious, won't this victory be worse than defeat?

If it is not madness to purchase the danger of such great destruction merely to appease one's anger and to fulfill one's desire to be called the greatest power on earth, then what is it? Whether it be the Soviet Union or America, whatever power dreams of winning a nuclear war is an enemy of its own existence and of the existence of mankind. And this is why all the far-sighted scholars of the world are with one voice demanding the destruction of nuclear weapons.

9914
CSO: 5100/5706

PAKISTAN

BRIEFS

SOVIET OFFER TO INDIA--Islamabad, Sept. 22: Soviet Union is understood to have offered to build a nuclear power centre in India, VOA reported tonight. The offer was made during talks of the visiting Indian Prime Minister Mrs Indira Gandhi with Soviet leaders. The capacity of the Soviet nuclear power centre will be double of the Tarapur Nuclear Reactor. [Text] [Islamabad THE MUSLIM in English 23 Sep 82 p 1]

ZIA DENIES CHINA'S ROLE--Rawalpindi, Sep. 22: President Ziaul Haq has denied reports appearing in the Western Press that China is supplying nuclear material to Pakistan. He was speaking to a group of foreign journalists here last night. He said that these reports were absolutely incorrect and were apparently designed to embarrass Pakistan and its friend.--APP [Text] [Islamabad THE MUSLIM in English 23 Sep 82 p 1]

NATION TO IAEA BODY--Islamabad, Sept 26--Pakistan was elected as member to the International Atomic Energy Agency's Board of Governors at Vienna for a two-year term yesterday. The polling for this seat was conducted during the 26th annual general conference of the IAEA. This is the 8th time that Pakistan has been elected to the IAEA Board of Governors said a press release of Pakistan Atomic Energy Commission.--APP. [Text] [Karachi MORNING NEWS in English 27 Sep 82 p 8]

ARSHAD REFUTES 'TIMES'' EDITORIAL--London Sept 27--Mr Ali Arshad, Pakistan's Ambassador in the UK has debunked, very forthrightly, the accusation made in THE TIMES editorial on Sept 24 which carried the "misleading impression that Pakistan is in the process of acquiring the capability to make Nuclear weapons." In a letter published in THE TIMES, on top of paper's Letter to Editor page. "The Allegation," the Ambassador says in his letter, "That Pakistan stole any nuclear data from Holland is a pure fib. Our modest-sized nuclear programme is geared solely to peaceful purposes." Concluding, Mr Arshad wrote: "Those who continue to purvey the fiction that Pakistan is making Nuclear bomb are those whose enmity towards Pakistan is beyond doubt. According to a PPI report from London the letter by Mr Ali Arshad, refers to THE TIMES editorial headed "Hindustan and the Bomb." The letter rejects notions that Pakistan wants to use Nuclear technology for atomic weapons, the BBC reported tonight. Mr Arshad wrote that Pakistani Government had been repeatedly declaring that it had no intention of making nuclear weapons. [Text] [Karachi DAWN in English 28 Sep 82 p 12]

CSO: 5100/4304

THAILAND

'CONFIDENTIAL' REPORT OF URANIUM SURVEY NOTED

Bangkok LAK THAI in Thai 26 Aug 82 pp 31, 32

[Article: "A Uranium Survey, a Game Or For Real?"]

[Test] Concerning uranium, during the past 50 years since scientists discovered the importance of this type of mineral, uranium has been used as a raw material to build "atomic" bombs to destroy each other. In the Second World War, Japan fell victim to "uranium."

But after mankind was hurt greatly by the use of atomic energy, very different types of studies were conducted with uranium in order to benefit mankind, with uranium being used to treat cancer and with it being used as a fuel for atomic power plants.

The importance of uranium for peaceful uses has increased continually. This has spurred on exploration for uranium in different parts of the world, and this includes Thailand too.

Recently, the Department of Mineral Resources wrote a "confidential" report on the results of a survey of uranium sources in various region of the country for the director-general of the Department of Mineral Resources so that he could report the results to the cabinet.

This "confidential" report has disclosed that, in the beginning, the survey team of the Department of Mineral Resources conducted aerial surveys of the uranium sources. They found strong indications of radioactivity throughout the Phu Wiang basin area in Phu Wiang District, Khon Kaen Province, and in the surrounding area. The area covers approximately 1,800 square kilometers. Levels of radioactivitiy that were higher than normal were found and so exploratory drilling will be done.

The "confidential" report of the Department of Mineral Resources also said that layers of sandstone having characteristics similar to those in the Phu Wiang basin where uranium was first found were surveyed. Surveys were conducted throughout Chaiyaphum, Khon Kaen and Udorn Thani provinces and in surrounding areas. The area surveyed totalled about 3,000 square kilometers.

Sandstone having such characteristics was found in the Phu Kao area in Non Sang District and in the Wua So basin area in Nong Wua So District, Udorn Thani Province, and in the Ban Khwao area in Khwao District, Chaiyaphum Province. The Department of Mineral Resources has plans to conduct more detailed surveys in these uranium locations as called for in the Fifth Economic Development Plan, which will expand on the initial surveys called for in the Fourth Economic Development Plan.

As for other uranium locations that may turn out to be important uranium sources, initial surveys covering 1,800 square kilometers have been conducted in Chiang Mai, Chiang Rai, Mae Hong Son and Lampang provinces.

The surveys of 11 tertiary basins, which are basins that have rock in which uranium is found, showed that four of the basin areas may contain uranium. The four are the basin area in Pai District in Mae Hong Son Province and the Om Koi, Bo Sam Li and Fang basin areas in Chiang Mai Province. More detailed surveys will be conducted later on.

Besides this, these surveys have also surveyed locations in which uranium may be present with fluorite. These surveys were conducted in the area of the Ling King Fluorite Mine at Ban Doi Tao in Doi Tao District, Chiang Mai Province. At present, the Department of Mineral REsources is conducting a detailed survey.

At the same time, the Department of Mineral Resources has surveyed triassic and carboniferous-period granite in Chom Thong, Mae Taeng and Fang districts in Chiang Mai Province and in Mae Sa Riang and Pai districts in Mae Hong Son Province. Granite with a uranium content of 1.6-23 parts per million was found.

In conducting these initial uranium surveys, the Department of Mineral Resources used vehicles to which were attached instruments for measuring radioactivity. The vehicles travelled through various areas measuring the level of radioactivity. This was done in Nakhon Ratchasima, Chaiyaphum, Khon Kaen, Udorn Thani and Phetchabun provinces and in some parts of Loei and Chiang Mai provinces.

The survey found that the level of radioactivity in these areas is higher than normal. Thus, there are prospects of finding uranium in the Ban Doi Nok Yieng Kao, Ban Han and Ban Sai Khlong areas in Kaset Sombun District and in the Ban Pracha Samakhi and Ban Non Salao areas in Phu Khieu District, Chaiyaphum Province, and in the Ban Doi Tao area in Doi Tao District, Chiang Mai Province.

As for the detailed studies conducted by the Department of Mineral Resources in the Pratu Tima area in the Phu Wiang basin in Phu Wiang District, Khon Kaen Province, the department used geological, geochemical, geophysical and radiometric methods and did exploratory drilling in order to determine the amount of uranium ore reserves.It also did drilling in order to study the rock strata and the accumulation of uranium at greater depths. It sunk 201 holes for a total depth of 5,464.45 meters.

Uranium was found at depths ranging from about 3 meters to 38.5 meters in three pockets. The survey found that there was approximately 31,000 metric tons and that the average quality was 0.04 percent U_3O_8.

As for the final results of the survey, this "confidential" report discussed the weaknesses. It said that the instruments used to measure radioactivity that were attached to the vehicles and the instruments used to measure radioactivity in the holes that had been drilled frequently broke down. Each time, much time was wasted fixing the instruments since parts had to be ordered from abroad. Thus, the work proceeded very slowly.

Besides this, during the exploratory drilling, sometimes it was not possible to carry on the work because of heavy rain, which made it impossible to move the drilling equipment to the area where drilling was to take place. At the same time, the means of transportation used to make the surveys was limited. Most of the vehicles were old vehicles that broke down frequently.

The foregoing is a "confidential" report on the results of the surveys of uranium locations in Thailand. It is an international survey report. But because of the fact that the capital and equipment used in the surveys was very limited, the uranium surveys conducted by the Department of Mineral Resources were actually just "amusement" type surveys. They were just "makeshift" surveys.

11943
CSO: 4220/5707

BRAZIL

CNEN CHIEF CARVALHO RESIGNS, REPLACED BY SECRETARY NAZARE

Rio de Janeiro JORNAL DO BRASIL in Portuguese 7 Sep 82 p 15

[Text] As of tomorrow, the new chairman of the National Nuclear Energy Commission (CNEN) will be the present executive secretary of the agency, Rex Nazare. He will replace physicist Hervasio de Carvalho, who held the CNEN chairmanship for 13 years and who yesterday morning presented his request for resignation, for reasons of health, to Minister of Mines and Energy Cesar Cals, in Brasilia.

Rex Nazare confirmed in Rio yesterday that "around 10 o-clock in the morning" he received a telephone call from Minister Cals inviting him to head the CNEN. Hervasio de Carvalho--who, the minister observed regretfully yesterday, "is a man who has an international reputation, and it is too bad that he has requested his resignation for reasons of health "--will hold the recently created position of special assistant to the minister for energy affairs. He will deal specifically with the areas of advanced technology such as nuclear fusion, fast breeder reactors and solar energy.

Seventh President

Rex Nazare is the seventh president of the CNEN. Since it was created in 1956, the National Nuclear Energy Commission has never had a chairman who remained in his position as long as Hervasio de Carvalho, who broke all records with 13 years on duty. The one who remained as CNEN chairman the shortest period of time was Arthur Mascarenhas Facanha: 1 and a half months. The first chairman of the CNEN was Admiral Otacilio Cunha.

"Rex Nazare related last night that: "Professor Hervasio felt that his health condition did not permit him any longer to keep up the pace of work that he had maintained for more than 12 years and decided to place the position at the disposition of the minister. He is going to Brasilia today to talk to Minister Cals before his installation Wednesday.

Nazare hesitated a little when he was asked if he planned to make changes in the CNEN and requested that he answer that type of question after he had already been installed. Nevertheless, he declared: "Every program of the CNEN is dynamic and, therefore, has to be adapted to new facts." In the meantime, Nazare emphasized repeatedly that he always had an excellent relationship with Hervasio de Carvalho.

At 11 o'clock in the morning yesterday, Hervasio de Carvalho was received by Minister Cesar Cals, to whom he presented his request for resignation. The two spoke for almost half hour and Hervasio decided to remain in the Deliberative Committee of the National Nuclear Energy Commission. Thus, he will not be completely detached from the CNEN. The deliberative committee acts as a council that analyzes all the decisions of the agency and the vote of the councilors carries weight in any decision taken by the CNEN.

Hervasio, 66 years of age, who suffered a heart attack last year, felt it impossible to shoulder all the responsibilities and tasks of the CNEN. According to aides of Minister Cesar Cals, that was the only reason why the CNEN chairman requested his resignation from the position.

Although all yesterday afternoon, Hervasio de Carvalho's secretary, Dona Wilma, insisted on advising that he was in Vienna and would stay there until the end of the month to participate in the International Atomic Energy Agency (IAEA) conference, Hervasio was in Brasilia and arrived at the headquarters of the CNEN in Rio after lunch. And the one who will leave for Vienna within a week will be the new CNEN chairman, Rex Nazare. He spent yesterday preparing to preside over a meeting in the IAEA on the 17th on the effects of Three-Mile Island.

The New Chairman

Rex Nazare Alves, soft-spoken and deliberate, a native of Rio, 44 years of age, spent almost all his nuclear career in the National Nuclear Energy Commission, which he will head as of tomorrow. A graduate in physics from the State University of Rio de Janeiro, and in nuclear engineering from the Military Engineering Institute, Rex Nazare in 1968 defended his doctoral dissertation, also on nuclear energy, at the Sorbonne in Paris.

He entered the CNEN in 1964 where he was working in the Nuclear Engineering Institute on the physics and chemistry of fission. From 1969 to 1975, he headed the Institute of Radio-Protection and Dosimetry. Finally, in February 1975, Nazare was invited to the executive board of the CNEN to replace Admiral Otacilio Cunha. Since 1980, he has also been the nuclear energy advisor to the Secretariat General of the National Security Council.

Rex Nazare, who before he rose in his "nuclear career" was even head of a college, is known to be an indefatigable worker. Even yesterday, despite having received the invitation from Minister Cals to become chairman of the CNEN, he stayed at work in his office at the CNEN until after 1900 hours.

The First Doctor in Nuclear Engineering

University of Chicago, 1953: The first doctoral degree in nuclear engineering was not granted to an American or a European but to a native of Minas and a Pernambucan at heart: Hervasio de Carvalho, who has just resigned as chairman of the National Nuclear Energy Commission for reasons of health.

The son of a doctor, Hervasio was born in Araguari, Minas Gerais, in 1916. In Recife, where the family had moved, he began his studies in engineering and law at 16 years of age. In 1940, Hervasio and another famous physicist, Jose Leite Lopes, went to Rio for the carnival and just as a joke register for the engineering college entrance exams of the University of Brazil. Leite Lopes passes in first place and Hervasio in second.

After working as a university professor in Campinas, he traveled to the United States and registered for the first atomic engineering course of the University of Chicago, where he completed his doctorate in 14 months. In 1967 he repeated his success in Italy, in the group of Professor Amaldi (disciple of Enrico Fermi, one of the fathers of the atomic bomb).

Before heading the CNEN for more than 12 years and being responsible in large part for structuring the present nuclear policy of Brazil, Hervasio de Carvalho was one of the most active researchers in the country: between 1961 and 1967 alone he published 73 specialized works. Of him, his successor Rex Nazare said yesterday:

"Professor Hervasio was the great lever that made possible the formulation of a number of programs that are being developed in the country today."

Rex Nazare is the seventh to take over the CNEN

Hervasio left for reasons of health

8711
CSO: 5100/2000

NEW CNEN CHAIRMAN INSTALLED, SUGGESTS POLICY CHANGES

Possible Policy Changes

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 7 Sep 82 p 31

[Text] Rio--The new chairman of the National Nuclear Energy Commission (CNEN), Rex Nazare Alves did not want to confirm or deny that the departure of Professor Hervasio de Carvalho was caused by cuts in appropriations for agency programs, explaining further that the CNEN will not necessarily have the same policy it received previously.

Rex Nazare said in Rio last night thay any program such as that of a nuclear agency has to be dynamic and has to adapt itself to new facts, pointing out that Professor Hervasio de Carvalho no longer felt in condition to give the same drive he had been giving to nuclear activities and placed his position at the disposition of Minister Cesar Cals.

The new CNEN chairman acknowledged that Hervasio de Carvalho was the great lever that made possible the development of the Brazilian nuclear program, and for 12 years he headed the CNEN, having been also one of the mentors of the nuclear program and acted as special advisor for nuclear affairs to the National Security Council. Paulo Nogueira Batista, in the diplomatic part, and Hervasio de Carvalho, in the scientific part, were the ones responsible for the German-Brazilian nuclear program, which gave birth to the Brazilian Nuclear Corporation (NUCLEBRAS) and its subsidiaries. According to Rex Nazare Alves, Hervasio is a scientist enamored over nuclear energy and everything he has done in the sector. Sixty-six years of age and in good physical condition, he, nevertheless, felt tired and will now be the minister's special advisor for the National Institute of Plasma and Nuclear Fusion.

Rex Nazare Alves was always considered the right arm of Hervasio Guimaraes de Carvalho, also advisor of the National Security Council and of the Presidency of the Republic. He is a native of Rio, 44 years of age, a graduate in physics from the State University of Rio de Janeiro, in nuclear engineering from the Military Engineering Institute, and has a doctorate from the University of Paris. He headed the Institute of Radio-Protection and Dosimetry from 1969 to 1975, when he was invited to replace the then executive director of the CNEN, Octacilio Cunha, who had died. Rex Nazare Alves has been in the National Nuclear Energy Commission since 1964. Previously, he worked in the Nuclear Engineering Institute (IEN), on research in the physics and chemistry of fission.

Since its founding in 1956, the National Nuclear Energy Commission has already had the following chairmen: Octacilio Cunha, Marcelo Damy, Artur Mascarenhas Facanha, Professor Cintra do Prado, Uriel da Costa Ribeiro, Hervasio Guimaraes de Carvalho, and now, Rex Nazare Alves. The installation of the new CNEN chairman is scheduled for tomorrow in the office of Minister Cesar Cals in Brasilia.

The National Nuclear Energy Commission is the agency that is responsible for all control and inspection of the Brazilian nuclear program and the other agencies and research institutions which in any way deal with nuclear energy in Brazil.

Necessary Adaptations Promised

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 9 Sep 82 p 32

[Text] Brasilia--The new chairman of the National Nuclear Energy Commission (CNEN), Rex Nazare Alves, was installed in Brasilia yesterday in the office of Minister of Mines and Energy Cesar Cals, promising to make the necessary adaptations to the dynamics of the nuclear program and the development of the country. However, he did not wish to cite those adaptations. His predecessor Hervasio Carvalho, who had headed the CNEN for the last 13 years, denied that he had left his position because of differences with the Brazilian Nuclear Corporation (NUCLEBRAS).

Witn regard to the nuclear program, Carvalho limited himself to saying that he is happy to see what he planted flourish. He thanked former President Costa e Silva, who appointed him to the chairmanship of the CNEN, former Presidents Medici and Geisel, and President Figueiredo, and concluded that his debts of gratitude "are as great as those of Mexico. If I had to pay them all I would go bankrupt."

Carvalho pointed out, in denying any differences with NUCLEBRAS, that he got along well even with the scientific community. "The scientific community had the habit of attacking the nuclear program but it always spared me perhaps because I was a member of the Academy of Sciences," he observed. He pointed out also that he always sought to listen to opinions "but I never let anybody run my commission."

Isolation

The departure of Provessor Hervasio de Carvalho from the CNEN, according to the opinion of representatives of the Sao Paulo scientific community, means a victory for NUCLEBRAS. The result of that, according to the scientists commenting, will be better coordination between NUCLEBRAS and CNEN which, in practice, will result in a greater isolation of the nuclear program under the pretext of sparing it from the criticism of society as a whole and from the technical-scientific community in particular.

Despite expressing a number of reservations about the performance of Hervasio de Carvalho, Sao Paulo scientists and technicians admit at least one positive point in it: his close connection, even professionally since he is a physicist, with the International Atomic Energy Agency (IAEA), an organization with headquarters in Vienna, Austria, which supervises the use of nuclear energy by the countries that have that technology.

The scientists commenting point out that until 1968, the Brazilian scientific community had been supporting the nuclear policy followed by the country, thereafter assuming an ever more criticial position. The last suggestion presented to the government, which if accepted could have reopened the dialog, was the strengthening of the CNEN, separating it from the Ministry of Mines and Energy. According to that proposal, which was not accepted, the CNEN would have become an independent agency subject only to the Presidency of the Republic and thus would have sufficient power to strictly oversee the possible policy errors in that sector.

For his part, the director-superintendent of the Institute for Energy and Nuclear Research (IPEN), Ernani Amorim, told O ESTADO that the resignation of Hervasio de Carvalho from the CNEN was due exclusively to problems of health. He denied the existence of differences between NUCLEBRAS and the CNEN. In Amorim's opinion, Nazare Alves will follow the same policy as his predecessor and the best proof of that, according to him, was the invitation of Minister Cesar Cals to the former chairman of CNEN to be advisor to the Ministry of Mines and Energy.

In the opinion of Federal Deputy Horacio Ortiz (Brazilian Democratic Movement Party (PMDB) for Sao Paulo), a member of the Mines and Energy Committee of the Chamber of Deputies: "Unfortunately, nothing is going to change with the resignation of Hervasio de Carvalho because both he and his successor are from the same team, both are supporters of the nuclear program, which has already been shown to be unnecessary, at least until 2020."

Ortiz believes that the program will be maintained despite the shortage of funds for the nuclear plant projects envisaged in the agreement with Germany. As regards the role of the AIEA, the deputy disagrees with the scientists because he believes that it is maintained exclusively by the "Atomic Club" to prevent any nuclear development, even for peaceful purposes, in the countries of the Third World.

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BRAZIL

CALS CONFIRMS ALTERNATIVE URANIUM ENRICHMENT RESEARCH

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 24 Sep 82 p 26

[Text] Rio--The Brazilian Nuclear Corporation (NUCLEBRAS) called a press conference to distibute an official note from Minister of Mines and Energy Cesar Cals denying the report published yesterday by O ESTADO and JORNAL DA TARDE, but only confirmed most of what we had reported. After denying that the Brazilian Government is going to revise or slow down the nuclear program, the note, in paragraph 2, says textually: "The report that the government has turned toward the development of two alternative lives of uranium enrichment because it does not trust the technical and economic feasibility of the centrifugal jet (jet-nozzle) process, as the newspaper reported, is without foundation."

Immediately afterwards, in paragraph 5, the note of the minister of mines and energy confirms the report of O ESTADO and JORNAL DA TARDE:

"The government's decision to develop research programs related to other alternative technologies in the uranium enrichment area is perfectly compatible with the industrial program already underway for the utilization of the centrifugal jet process. It is a matter of opening up alternatives in the mastery of technologies in the nuclear area, establishing a new and desirable scale of values."

Following is the full text of the note from Minister of Mines and Energy Cesar Cals:

"With reference to the report published in the newspaper O ESTADO DE SAO PAULO today, 23 September, under the caption "Brazil Slows Down Program With Germany," the minister of mines and energy makes the following clarification:

1. The report that the Brazilian Government has decided to revise and slow down its nuclear program is without any foundation; it continues to be carried out within the time periods envisaged and established by the government.

2. The report that the government has turned toward the development of two alternative lines of uranium enrichment because it did not trust the technical and economic feasibility of the centrifugal jet (jet-nozzle) process, as the newspaper reported, is also without foundation.

3. What there is with reference to uranium enrichment is an industrial program developed by the NUCLEBRAS, through its subsidiary, NUCLEBRAS Isotopic Enrichment Corporation (NUCLEI), and a research program developed by specialized institutes, having very different objectives and scale of values. The objective of the industrial program is the installation in Resende Municipality, of an enrichment plant utilizing the centrifugal jet process, with completion of the first stage in 1983, the second in 1986 and an extension of that plant in 1988. The work of installing the NUCLEI plant, already in the equipment installation phase, is well underway.

4. The feasability of the centrifugal jet enrichment process has already been proved on a laboratory scale and on a pilot scale. The installation of the plant in Resende is aimed at optimizing the process, which is normal in the development of any technology.

5. The government's decision to develop research programs related to other alternative technologies in the uranium enrichment area is perfectly compatible with the industrial program already underway for the utilization of the centrifugal jet process. It is a matter of opening up alternatives in the mastery of technologies in the nculear area, establishing a new and desirable scale of values."

Not Being Abandoned

Minister Cesar Cals declared that the jet-nozzle uranium enrichment process will not be abandoned "but that at the same time we are not obliged to remain restricted to only that process of technological development. We are pursuing and developing research of other processes of uranium enrichment, and resources will not be lacking for that purpose."

The minister of mines and energy also confirmed that an institute will be installed in Itaguai, in a place called Campo de Roma, to assemble in a single site all the task forces that are doing research and work with plasma physics and nuclear fusion in Brazil, now spread out in universities or other agencies.

He pointed out also that the nuclear program called for nine nuclear plants and that it will be fulfilled by the year 2000 because that program is aimed at mastery of the fuel cycle technology, and the uranium enrichment process by centrifugal jet will be accomplished.

Cals said that he was personally in Germany, visiting the Siemens facilities and checking the current stage of technological development of the nozzle and dispelling his doubts. In his opinion, "if Siemens itself showed its readiness to build a factory for elements (nozzles) and components of the process in Curitiba, it is because the Germans believe in that process."

This time, the minister of mines and energy did not again justify the nuclear program on the basis of the country's energy needs but rather "because that program was fully paced so as to give continuity to scientific training and the education of specialized personnel, as well as to establish a nuclear energy industry. How can we lead the private entrepreneur to prepare himself in terms of the training of personnel, safety control and quality control if we do not lend continuity to the nuclear program?" asked Minister Cesar Cals, in conclusion.

Ministry Says Nuclear Program Will Be Fulfilled

In an official note yesterday, the Ministry of Mines and Energy denied that the Brazilian Government has decided to revise or slow down the nuclear program. "The program continues to be carried out and within the time periods established by the government," says the note. The ministry also denied that the development of two alternative lines of uranium enrichment on the basis of laser rays and ultracentrifugation is due to suspicion that the jet-nozzle centrifugal jet process purchased from the German KWU company is technically and economically vulnerable.

The note from NUCLEBRAS in Rio de Janeiro, sent to the ministry by Telex, however, does not confirm or deny the report by O ESTADO that the jet-nozzle uranium enrichment process by the double deflection system will raise the cost of the demonstration plant that is under construction in Resende (Rio de Janiero), from $282 million to $1.5 billion.

"What there is with reference to uranium enrichment" adds the note "is an industrial program developed by NUCLEBRAS, through its subsidiary, NUCLEBRAS Isotopic Enrichment Corporation (NUCLEI), and a research program developed by specialized institutes, having very different objectives and scale values. The objective of the industrial program is the installation in Resende Municipality of an enrichment plant utilizing the centrifugal jet process, with completion of the first stage in 1983, the second in 1986 and an extension of that plant in 1988, already in the equipment installation phase. The work of installing the plant is well underway."

The ministry note points out also that the feasibility of the uranium enrichment system by centrifugal jet has already been proved on a laboratory scale and on a pilot scale. According to the note, the installation of the Resende plant for uranium enrichment using the centrifugal jet process is aimed at "optimizing the process, which is normal in the development of any technology."

Finally, the note explains that the government's decision to develop research programs related to other alternative technologies in the uranium enrichment area "is perfectly compatible with the industrial program already underway for the utilization of the centrifugal jet process, aimed at opening up alternatives in the mastery of technologies in the nuclear area."

NUCLEBRAS

In Rio, NUCLEBRAS, through its press aide, Cesarion Praxedes, refused to provide any clarification about the main problems of the jet-nozzle uranium enrichment process, alleging that such matters are "strategic and in the area of national security."

According to the NUCLEBRAS spokesman, no director of NUCLEI could provide any explanation about the jet-nozzle process because that "was not being done anywhere in the world." And added: "Go to URENCO and ask how many centrifuges are in operation and at what cost to see if they tell you."

So the public remains ignorant of the reason that led the Germans to sign a shareholders agreement in which they disavow any and all responsibility for the future failure of the jet-nozzle technology.

Another basic point that NUCLEBRAS refuses to explain is the cost. Originally, an industrial plant was planned in which the process was based on a system called single deflection and a compound of hydrogen gas and uranium hexafluoride. That unit would cost $282 million but its economic feasibility was problematic because its production rate--the Separation Time Unit (UTS)--was $5,000, compared to $600 for the ultracentrifuge.

A new industrial plant was then planned to be to be coupled to the first one, based on an improved system of dual deflection and a compound of helium gas, since hydrogen gas cannot be used in large industrial units because of the danger of explosions. It so happens that installation costs increased with the second unit, from $282 million to $1.5 billion, so that the small gain in economic savings from the process does not justify the brutal increase in the cost of the fixed installations. In addition, that industrial complex will require a fixed and permanent consumption of 1.5 million kilowatt-hours for its operation, or the equivalent of a medium-sized hydroelectric plant operating exclusively for the Resende uranium enrichment plant.

KWU Belives That Slowdown Is Uneconomical

The spokesman of KWU-Kraftwerk Union in Brazil, Wolfgang Breyer, said yesterday that Brazil is already slowing down the nuclear program but you reach a point where it is no longer possible to do so at the risk of making it uneconomical and losing all the work done in educating personnel and training as well as demobilizing Brazilian private enterprise that invested in it.

With regard to the nuclear reactors, Breyer revealed that there are commercial contracts for the purchase of the Angra-2 and Angra-3 units only, each in the amount of $1.84 billion. For plants 3 and 4 to be built in Iguape, on the Sao Paulo coast, there is only the negotiation of commercial contracts, in which the maximum and minimum participation of Germany and Brazil will be stipulated; the intention being that there be a minimum of 70 percent national participation on the average for the two.

Wolfgang Breyer explained that the delays already effected in the nuclear program will benefit Brazil because the average of national participation for Angra-2 and 3, formerly set at 55 percent could be increased. In this connection, he pointed out that the pressurizer for Angra-3 will be built in Brazil, contrary to what had been planned.

In his view, there is no slowdown in the transfer of the fuel cycle by Germany; "it is less off-schedule than the construction of the nuclear reactors." With regard to the jet-nozzle project, he said that the research is being developed in a normal way in the Karlsruhe laboratory in Germany, a big program having been set up in order to increase the scale of the components of the commercial plant.

Breyer pointed out also that several countries that hold uranium enrichment patents are doing research with laser rays and with the chemical method in an attempt to improve the economic feasibility of those processes. In his opinion, "Brazil is free to research other technologies not included in the nuclear agreement."

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COLUMNIST PRESENTS CASE FOR BRAZILIAN BOMB

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 2 Sep 82 p 2

[Article by Mauro Chaves: "A Reflection on the Bomb"]

[Text] From time to time, accusations have emerged abroad about the technological possibilities, the veiled intentions, the political decision already taken (and well camouflaged) and even the possible concrete "preparations," pertaining to the manufacture of our first atomic bomb, which allegedly is within the secret capability of our ongoing nuclear program stemming from the notorious Brazilian-German agreement.

In June of last year, Professor David Lanning of the Nuclear Engineering Department of the Massachusetts Institute of Technology (MIT) declared that in only 1 year after Brazil's nuclear facilities go into operation, "they will be able to produce, plutonium in sufficient quantity to build a considerable arsenal of atomic weapons."

Last month, the German magazine DER SPIEGEL published material (reprinted by the JORNAL DA TARDE) on the "atom bomb" plans of the Brazilian military and their acceleration after the Malvinas war. According to the weekly, there is allegedly a broad plan under the supervision of the National Security Council that is aimed at giving our armed forces total mastery of military nuclear technology: the air force allegedly is quite advanced in research conducted at the Aeronautics Technology Center (CTA) in Sao Jose dos Campos, not only in connection with construction of the bomb properly speaking but also in the development of missiles to carry the nuclear weapons; while the army is allegedly expanding its research center in Marambaia to house laboratories as complete as those of the CTA. The Navy, in turn, is allegedly devoting itself to nuclear submarine research, with regard to which the magazine expressed the serious suspicion that the announced plan to purchase two German submarines of the IKL-209 type is directly connected with that research.

As always happens, those charges have merited the flattest denial from the Brazilian military authorities, who always assert and reassert that use of nuclear technology for military purposes has never figured in our plans since our desire is to use it for exclusively peaceful purposes--which, furthermore, is the position we have adopted in all the international forums in which the subject is discussed.

Very well. With regard to those denials, "there are always two possibilities," as the character Jacobowsky played by Danny Kaye in the film, "The Colonel and I," used to say. That is: either the military are not speaking the truth and there really are well-advanced plans for the manufacture of a native A-Bomb--a deception that is perfectly justifiable in such a case, inasmuch as no nation boasts of its own bomb before exploding it; or the Brazilian military are telling the truth--a possibility in which we do not have any prospect of entering the Atomic Club, which could lead us to a great surprise, a great fright (or panic?) on the fine day when the first Argentina A-Bomb explodes (experimentally, of course), blasting into the radioactive air the pages of the Treaty of Tlatelolco and everything else.

To better reflect on these two possibilities let us go back in time--15 years. In May 1967, the then President Costa e Silva made a thunderous speech in Urubupunga which resounded for many weeks in the national and international press. The marshal spoke out enthusiastically about the need for our nuclearization, speaking expressly about "atomic explosions" for our development, such as the opening of interconnecting river canals in the Amazon, etc. In the meantime, in an interview granted to the JORNAL DA TARDE, the then Foreign Minister Magalhaes Pinto announced that our first atomic bomb would be built during the Costa e Silva administration. So the subject of the "Brazilian A-Bomb" entered the order of the day, and the most "pessimistic" predictions were that it would still be 6 yeras before we would explode our bomb--consequently, it would explode in 1972. (At that time, the magazine TIME published a report which stated that "any industrial society will be able to build its own bomb similar to the one that razed Hiroshima within 5 years and with $100 million.")

With the advent of the Brazilian-German agreement, and the consequent development of our nuclear program, Brazilian official talk changed completely; they began to speak exclusively about nuclear energy and never about "atomic explosions." Thus a cyclopean, very costly, long-term program was formulated, beyond our economic possibilities and real energy needs, plunging us into debt up to the hilt, but for some unexplainable scruple there was no mention of any need for us to acquire the status of atomic power; there was no mention of national defense (in a military system so concerned with national security); of what the long-term protection of our immense territory means; of the right we have to manufacture the bomb--since if other "Third World" countries already have it, why not we? And why have we up to now stubbornly refused to sign the "Nonproliferation Treaty"?

Sometimes we are left imagining that in these 15 years there has been a great detour--so great to the point of our having "tied ourselves up" in so many antibomb commitments, stemming from clauses of the nuclear agreement itself--that we are much farther away from the bomb than 15 years ago. (And what if the TIME recipe was correct and we could have built it for only $100 million and without any nuclear agreement?)

The fact that no one has succeeded in giving a convincing explanation for our nuclear program perhaps stems from the fact that on the way we have "forgotten" the original, real motivations...

On the other hand, we believe that a certain antimilitaristic delight--quite understandable in societies subjected for long years to politico-military tutelage--may lead many to regard any consideration regarding the need for a Brazilian bomb as a real absurdity, an "arms race," a taboo, a sin. But let us agree: the Atomic Bomb is still comprised in its majority of representative democracies. And if there is one type of weapon not susceptible to being used internally by dictatorships for the intimidation of a civilian society, it is the nuclear weapon. Now, as for the ecological-perservationist aspect, we can observe that in no country belonging to the Atomic Club has there been so much disregard for nature, so much depredation of the environment as that prevailing in the absolute majority of the Third World and non-nuclear countries.

In view of all of that, why do we not put aside our false temptations, and once and for all get the bomb into our head before some adventurer of the Galtieri type gets his hand on it?

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SAO PAULO TO BE SITE OF REMAINING SIX NUCLEAR PLANTS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 22 Aug 82 p 49

[Text] Brasilia--The remaining six nuclear plants of the total of eight units in the Brazilian-German agreement will be built in Sao Paulo, on the coast between Peruibe and Iguape, according energy sector experts. Formalization of this decision by the Brazilian Nuclear Corporation (NUCLEBRAS) reportedly depends only on the reuslts of the studies to be conducted by the Brazilian Electric Power Stations Corporation (ELETROBRAS) and by the Sao Paulo Power Company (CESP), to identify the influence of the state's electric energy market on the Southeast region. This region consumes about 60 percent of all the electric energy generated in the country.

According to the sources, three factors led NUCLEBRAS to decide on the construction of the six nuclear plants in Sao Paulo: to utilize the siting studies conducted by the American Kaiser Engineering Corporation in the Sao Paulo coast, considering that this type of study is very expensive and requires a long time. It is no longer necessary to conduct a public opinion campaign because the Sao Paulo population has already accepted the construction of two plants on its coast (Iguape-I and II). Sao Paulo is the state that consumes the most electric energy, therefore, it is the region that is going to require an increase in its installed energy generating capacity when the country's economy emerges from the present recessive phase.

However, no date has been set for the beginning of construction of the six plants although Iguape-I and II are in the phase of preparation of their project beds and Minister Cesar Cals has officially announced that the construction of four nuclear units is going to be begun during Figueiredo's administration. Only two construction projects have been begun during the current administration, in Angra dos Reis. The projects of the remaining four units under the Brazilian-German agreement will not be begun until the next administration, according to Cals' announcement early this year, when he defined "Plan 2000," a document that forecasts the generation and consumption of electric energy in the country until the end of the century.

Energy sector exports have reported that in addition to the 1-year delay in the date scheduled for the entry into operation of Angra-II, going from 1986 to 1987, the nuclear program will undergo new delays in the event that the official forecast of the increase of electric energy consumption in the country is not confirmed: in the order of 7.7 percent per year until 1984 and after that date a faster increase of 10.8 percent per year.

They explained that the electric energy companies are decapitalized and have debts of approximately 80 billion cruzeiros to pay this year because of the 3 percent drop in the consumption of electric energy in 1981 compared to previous years, when consumption was growing at an average of 10 percent per year. ELETROBRAS is predicting an increase of consumption of 6.5 to 7 percent for this year. And in the event that these percentages are not confirmed, the electric sector will not even have the renevues to touch the current projects let alone begin new ones. The projects in the electric sector add up to 22 hydroelectric plants, 2 nuclear plants (Angra-II and III) and 2 thermoelectric plants, one in Rio Grande do Sul and the other in Santa Catarina.

By 1992, the installed energy generation potential will increase by more than 40,000 megawatts. Of this total, 2,200 megawatts pertain to the hydroelectric plants that will go into operation this year and Angra-I in 1985. In the meantime, the current surplus of energy is in the order of 2,500 megawatts. That surplus will grow significantly after 1983 when Itaipu's first three turbines, of 700 megawatts each, go into operation. For 3 months, Itaipu's 2,100 megawatts will be "thrown out" because the transmission line will not be ready until 3 months after the plant goes into operation because of the 10 percent cut in the expenditures provided for the line project.

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BRAZIL

BRIEFS

INCREASED URANIUM RESERVES--Brazilian uranium reserves increased from 266,300 to 301,409 tons, 192,540 tons of which are classified as measured and indicated, and 108,950 tons as inferred. This amount of uranium is enough to supply 30 nuclear reactors of the PWR type (light water and 3 percent enriched uranium) of 1.3 megawatts each for their whole useful life of 30 years. That information was covered yesterday to the Ministry of Mines and Energy by the Brazilian Nuclear Corporation (NUCLEBRAS). According to the ministry, the increase in Brazilian uranium reserves is due mainly to the work carried out in the uranium-bearing region of Lago Real, in Bahia, which increased from 63,000 to 93,190 tons, and to the increase in the total for the country's largest reserve, that of Itataia in Ceara, which went from 137.500 to 142,500 tons. The previous uranium reserves of 266,300 tons were announced last year and are included in "Plan 2000," a document prepared last March, which forecasts the generation and consumption of energy until the end of the century. The ministry announced also that this week NUCLEBRAS will become a member with voting rights of the Uranium Institute during the meeting of that international agency which is being held in London. [Sao Paulo O ESTADO DE SAO PAULO in Portuguese 22 Aug 82 p 49] 8711

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RISING COSTS MAY END KALKAR FAST BREEDER PROJECT

Hamburg DER SPIEGEL in German 13 Sep 82 p 27

[Article: "Imminent End"]

[Text] Neither Bonn nor industry wants to continue to pay for the fast breeder. The costs are getting out of hand.

As late as February Research Minister Andreas von Buelow said that he does not believe in constantly discussing new prognoses for the fast breeder. Cost increases, according to von Buelow, can also be conjured up by talking about them.

In June he himself then talked about higher costs: The breeder would, after all, become more expensive than foreseen. "Heads must roll; the whole thing is a mess!" Chancellor Helmut Schmidt fumed.

Heads have not rolled. Meanwhile, von Buelow has also had to get used to the latest findings: Another financial gap of about DM 1.5 billion has occurred for the Kalkar fast breeder, which is to guarantee better utilization of fissionable material.

The nuclear reactor will not cost DM 6.5 billion and not 5 billion, as the builder, the Fast Breeder Nuclear Power Corporation (SBK), insisted as late as last year.

The SBK people allocate DM 1.1 billion for "unavoidable" construction costs, 300 million as risk surcharge and another 100 million for interest payments.

This, however, caus-d the financing concept devised at the beginning of the year by the research minister to falter. The imminent end of the ambitious nuclear power project seems near.

For the second time in one year von Buelow is facing a financial debacle. In September 1981 the SBK people had surprised their chief funding source with the information that the fast breeder would not cost DM 3.9 billion, as they predicted as late as 1980, but about DM 5 billion. A halt to construction threatened even then, because the minister's funds were only sufficient for the original calculation.

After drawn-out negotiations Buelow in February finally persuaded the reluctant electricity supply companies (EVU) to contribute the missing 1.1 billion. However, they tied their consent to the condition, among others, that they would not have to make good their promise to pay until the total financing had been arranged. In addition, the coalition's parliamentary groups were to withdraw their reservations against a start-up.

At least the first condition has not been met. The enterprises thus do not have to feel bound by their agreement.

In order that construction on the breeder could continue, von Buelow--in anticipation of the EVU money--had initially advanced DM 500 million from his budget. If the power producers now will not pay the agreed-on 1.1 billion, the entire amount--even if construction is halted--will become the taxpayers' burden, Orders have already been placed for the money.

"The risk," Buelow's spokesman Harald Uhl admits, "is entirely on our side."

The decision as to whether and how the EVU are to make their contribution to the energy-political prestige project must be made by the end of October, because that is when the cabinet will decide whether or not the breeder is to be completed. Even if the power producers arrive at a favorable result--their money is wholly included in the 1983 budget proposal--it is now completely open to question how Buelow is to plug the additional billion-DM hole.

For the power producers do not want to pay any more than the presently agreed-on DM 1.1 billion. Buelow believes that he could expect at most another 100 to 150 million.

Furthermore, the coalition parliamentarians are slowly beginning to realize that no one can be convinced with the argument of cheap nuclear power, when the price of power is already going to be noticeably raised, as the electricity producers intend to do, in order to finance only one reactor. Even among breeder fans, in the opinion of SPD-delegate Wolf-Michael Catenhusen, the tendency is growing for conducting the Bundestag debate on the safety of the breeder scheduled for the end of October "not entirely detached from the aspect of financing."

The discussion of cost comes just at the right time for breeder opponents in the SPD and FDP. Thier hope is that the project could still be brought down by this issue. They scarcely expect any help with their arguments from the Nuclear Energy Inquiry Commission established by the Bundestag.

The commission deals exclusively with the safety aspect of the reactor. But when the members vote on 24 September they must base their opinions on highly confusing material.

The commission had charged nuclear proponents as well as opponents with the task of studying in detail whether the breeder is more dangerous than conventional light water reactors. However, instead of a joint report the two groups of scientists only reached two opposite conclusions.

As expected the proponents evaluate the risks of the breeder as lower than those of the light water reactors. According to the calculations of the critics, however, the new type of reactor poses a risk greater by a factor of 20--measured in potential accident results.

"The attempt to deliver a scientific foundation which can later be implemented has failed," the chairman of the commission Harald Schaefer admits. The commission, which in any case is largely filled with nuclear energy proponents, is now likely to vote in favor of the breeder but at the same time to request additional safety regulations.

This throws everything wide open once again, however. The breeder could begin operation at some time, to be sure, but the additional regulations, as the Research Ministry has already calculated, would increase the financial gap from 1.5 to 2 billion.

"As for the future of the fast breeder," Research Minister von Buelow says resignedly, "I am prepared for all eventualities."

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OVERVIEW OF NUCLEAR, ENERGY POLICY DEVELOPMENTS

Duesseldorf ATOMWIRTSCHAFT/ATOMTECHNIK in German Aug/Sep 82 pp 448-452

[Article by H. Gassert, chairman of the managing board of Brown, Boveri & Cie. AG, Mannheim, P.O. Box 351, 6800 Mannheim 1; revised version of the plenary-session paper read at the annual conference on nuclear engineering of the Deutsches Atomforum and the Nuclear Engineering Association, held on 4-6 May 1982 in Mannheim]

[Text] For some years now, the expansion in the use of nuclear energy and the further development of nuclear engineering have been found in a paradoxical situation in the FRG: The great importance of this source of energy is sworn to in political and economic quarters, and the speedy expansion of nuclear power is made out to be indispensable to the general economy and energy economy. However, in practice industry and the electricity sector find themselves faced with unending obstacles and quarrels which in their absolute single-mindedness are beginning to cast doubt on the advantages of nuclear power, at least in our country.

1. Scene Shifting

In a time when scarcely a day goes by without the issue of nuclear power plants and waste disposal being treated, and obviously needing to be treated, unfortunately, in some way or other in the press, a site determination causes a great deal of trouble. Subdued optimism that the breakthrough would now succeed before long--namely that the realization was growing about how practical and necessary nuclear energy is--still is accompanied by political temporization. Thus the debate goes on.

Just recently, coal-fired power plants have come into the field of fire again also, since their sulfur-dioxide emissions are supposed to be responsible for acid rain, acid soil, and thus for the dying away of the forests. At least nuclear power plants are not the cause of that. What is meant by "scene shifting" becomes clear by reference to an article headline in DIE WELT of 15 April 1982, which reads: "Nuclear Energy as the Last Resort of the Environmentalists?"

Obviously that which the much-maligned and so-called "nuclear-power lobby" has predicted as a warning for years is beginning to have an effect on energy policy:

- Electricity-generation costs are beginning now to increase appreciably for the private citizen, and for certain basic industries they are already too high--that is, they are destroying competitiveness.

- The excessively high technical requirements placed on nuclear power plants, with the thereby resulting costs and long construction times, are beginning to cause financing problems for the operators.

- The manufacturers are having a noticeably hard time not only continuing to hold available their capacities, but also maintaining an internationally competitive technology.

Now investment incentives are absent in truth, and instead of a certainly desirable cautious restructuring of German industry on a satisfactory general economic level, we have fallen into a deep trough of underemployment which is becoming increasingly more difficult to get out of. On this point it must be clearly said that the smaller power-consumption growth rates are, after all, the result of energy conservation only to a relatively small extent. At least half of such smaller rates can be attributed to the business slowdown. Moreover, they are also the consequence of already completed restructurings in industry.

Finally, in our striven-for "cordon sanitaire nucleaire" we have fallen into a true catch-22 situation with respect to economic efficiency, safety, and environmental protection:

- The fact that in the East nuclear power plants are regarded as indispensable and therefore are being built with nonchalance has been taken cognizance of in this country always in terms of ideological "judgments" only.

- The fact that our large neighbor in the West is building nuclear power plants in a way which systematically follows a clear economic-policy plan could someday bring us economic realizations which really were not wanted.

But much worse for us is the fact that our neighbors in the East and West are taking a chance on the supposed nuclear risks because they rate as even greater the risk of not having a reasonably-priced energy supply for their economies, in view also of possible sociopolitical problems. But since the geographic position of the FRG does not offer any great distances to the borders in the East and West, even at an imagined center, our safety with respect to nuclear power plants is the same as that of our neighbors, and with respect to fossil-fired power plants half of the immissions which come down in the FRG comes also from our neighbors. We hope that this observation is not construed as an argument against safety engineering and environmental protection, but rather is interpreted in terms of the necessity to point out time and again that we are not alone in the world and that in other countries as well, risks are not being trifled with.

Thus, if we carry on like we have been we will end up acquiring all the disadvantages of an economic nature, and we will then have to make do with the remaining advantages of a moral sort. It is doubtful whether our society will be content with that, or whether the consequences will still be so moral after all. I am sure that you recognize the concern which we must have and which finds expression in the bon mot: "It is not energy, but time, which is running out."

2. The Third Updating of the Energy Program

Every business--above all one run on such a long-term basis as the nuclear power plant business--needs some planning, a program. A state as well must have this. Therefore we were glad about the energy program of the Federal Government, and we are studying the Third Updating with great interest. This departs from the residual-need philosophy and once again assigns to nuclear energy a job of helping to meet our energy needs. Unfortunately, quantitative particulars are lacking in this updating which could make this a working program. In this respect, the Third Updating differs quite fundamentally from the nuclear-power program in France, for example.

According to the tenor of the Third Updating, nuclear power should find its place in the overall economy by way of the mechanisms of the market economy. In this respect a sound prescription, since in this way nothing economically foolish can happen by using it, in the short run at least. But on the other hand, for nuclear power plants in particular the State has at its disposal the entire arsenal of constructing requirements within the framework of the licensing procedure, and at any time it can thus curb or block the impellants which come from free-market decisions by the electricity sector.

Despite all the esteem expressed for the market as a regulating device, its effectiveness is still very limited when objectives in the national economic interest are also to be implemented more or less in parallel. In the case of nuclear energy, the following objectives are in competition:

- ability to accurately estimate capital expenditures,

- reasonably-priced energy for the consumer,

- a reliable energy supply to the consumer,

- minimal polluting of the environment,

- no endangering of the environment,

- reducing our dependence on imports.

Of course, these objectives are not harmonious. They must be harmonized along the lines of a balancing of advantages and disadvantages for the sake of the whole, and what is needed for that is a consensus of the sort so readily cited nowadays. Indisputably, in a democratically governed constitutional state consensus is a fundamental political duty. But, and it is becoming harder and harder for us to realize this, a consensus should also predominantly incorporate the interests of majorities, and moreover it needs also to be genuine. However, since the issue of nuclear energy has to do with a debate among representatives, the consensus we must come to, of course, is the one on the question "how do we want to live in the future?" And this is a sociopolitical question. But the opinion of the majority would be of significance here also. Anyway, back to our concrete problem.

At present, those political forces which via legislation eventually find their expression in licensing practice are turning nuclear power plants into a hazardous enterprise economically in many cases, for both the operators and the manufacturers, inasmuch as construction time and equipment--and consequently construction costs--cannot be predicted. Thus the goals are yet to be realized by means of wishful projections alone--see the Third Updating of the energy program. In looking for the quantitative aspect as the key and essential content of a program--how else could one compare the actual and the desirable condition--we find in the Third Updating the notion that in the year 1995 the FRG's energy supply should be covered in the following way:

- 1/3 by coal,
- 1/3 by oil, and
- 1/3 by other energies, including natural gas, water power, and Miscellaneous Energy Sources, as well as nuclear energy.

That is, understandably enough what is important above all is to reduce oil use from 44.5 percent (1981) to 33 percent (1995) (Figure 1). Can this objective be realized from today on, and what would this mean for nuclear power plant construction?

An estimate should show in what range must the share held by nuclear energy lie at the least in 1995, if the primary-energy demand is to be covered by means of the above-mentioned "three-way parity."

2.1. Zero Growth in the Energy Consumption?

If one assumes first that the appeal to a rational energy use leads to the situation that in 1995 the primary-energy demand is not higher than it was in 1981 (= 371 million tons of SKE [hard coal units]), then the second trend statement--that only 1/3 of the total primary-energy consumption is to be satisfied by oil--forces us to take measures to find substitutes for oil. And such substitutes for oil, which in 1981 had made a 45-percent contribution to meeting the primary-energy demand, will thus be on the order of magnitude of 12 percentage points of primary-energy consumption.

On the other hand, in 1981 hard coal with its 21 percent and brown coal with its 11 percent already made up roughly the fraction of 33 percent earmarked for coal, so the substitution of 12 percentage points in the case of oil can be done only by way of the other energy sources of natural gas, water power, Miscellaneous Energies, and nuclear energy.

In the case of natural gas, we just assume that it will be able to maintain in 1995 the same share of 16 percent of the primary-energy supply that it had in 1981, even though this is a question of an energy source, or sources, which can just as easily either dry up or bubble over, depending on political circumstances.

Because of the relations between geographic conditions and economic prerequisites in the FRG, water power cannot contribute substantially more than the share of 2 percent that it had in 1981 to meeting this demand. The Miscellaneous Energy Sources, which in 1981 made a contribution of 0.8 percent to the meeting of the demand, will be able to have a share in 1995 of about 2 percent--realistically seen--in the coverage of the demand for primary energy. Even this, with a growth of 1.2 percentage points, would already signify more than a doubling compared to the present contribution, and the technical and financial expenditure for this should not be overlooked. Of course, on this point it is possible to have a completely different opinion, and the possibility should not be ruled out that by the end of this century a few percentage points more may be realizable. But in principle this does not alter our above estimate, because the assumed zero growth of primary-energy consumption by 1995 is already a bold assumption.

Thus from the requirement that in 1995 oil should have a share of only about a third in the coverage of the primary-energy demand, we find a gap of about 13 percent. Nuclear energy has the capability of filling this gap, which relative to such energy is equivalent to about 29,300 MWe of nuclear power plant output. On the other hand, the nuclear power plants in operation at the end of 1981, with a total output of 10,400 MWe, had a 4.6 percent share in the coverage of the primary-energy demand, and so assuming zero growth for the primary-energy consumption we obtain altogether a nuclear power plant buildup output of about 19,000 MWe by 1995. This corresponds to a rate of increase of about 15 nuclear power plants of the 1,300-MWe class in a period of 13 years, or to 1.2 nuclear power plants per year.

Whether the authors of the Third Updating saw that their trisection assumption means a pronounced involvement on the part of nuclear energy in meeting demand--for example, in connection with space heating and transport--is not obvious from the text. In France, this is clearly the way being taken to reduce oil consumption.

2.2. Growth in the Consumption of Primary Energy?

A moderate growth in the primary-energy demand of 1.5 percent annually is equivalent, at a constant rate, to an overall growth of 20 percent in the primary-energy demand from 1982-1995, and thus in 1995 it would merely lead to the primary-energy consumption of 445 million tons of SKE. In that case, the share going to nuclear energy is at least the same proportion as that which it must assume in its sector according to the foregoing derivation (13 percent). This corresponds to about 10 million tons of SKE and thus to 6,000 MWe of nuclear power plant output brought about by the growth in the primary-energy demand. Thus, together with the previously derived overall demand of 29,300 MWe of nuclear power plant output, we now have a demand of 35,300 MWe for 1995.

Furthermore it is well known that brown coal, for example, cannot take on the share which it is supposed to provide from an assumed growth of 20 percent--a share which comes to about 8 million tons of SKE. If one fills this gap through nuclear energy, the result is again about 4,900 MWe of nuclear power plant output, or 40,200 MWe altogether. This would require already an annual growth rate of two nuclear power plants per year up to 1995, and all this with an assumed growth in the consumption of primary energy of only 1.5 percent per year up to 1995 (Figure 2). Other scenarios arising from other growth rates in the primary-energy consumption or from considering the question of the shares the individual energy sources may have in meeting demand are not going to be treated here.

In summary, the attempt at a quantitative exegesis of the Third Updating of the energy program has the following appearance: Even after a consideration of all conservation possibilities and substitutions in the energy sector, the role assigned to nuclear energy in coming years will be significant in quantitative terms as well. The question is whether nuclear energy will be able to play this role at all, considering the present construction times and construction costs. In light of the "ritardando" which has been going on for years now, an "accelerando" surely is not possible immediately. Precisely this is the big mistake made by the proponents of a moratorium, who probably think that one can drive forward and in reverse at will with the realization of such a sophisticated technology.

3. Measures

It is important that we succeed in again shortening the construction times and in lowering the costs. In no way whatsoever would this have a negative effect on the level of the safety engineering involved. On the contrary!! Because it turns out that with the presently common completion times of 11 years on the average for nuclear power plant projects, all of the decisions on those nuclear power plants which are to be on line by 1995 would have to be made in the next 2 years. These decisions pertain to a total capital expenditure which is calculated as follows: About 15 to 23 nuclear power plants, multiplied by DM 6 billion per nuclear power plant, = DM 90 to 140 billion. This is simply inconceivable from a business point of view. Therefore measures should be introduced for shortening the project execution times for nuclear power plants having 1,300-MWe pressurized-water reactors to between 6 and 7 years as measured from the receipt of the application up to commercial operation. From the manufacturer's side, this is realizable provided that during the project's execution the technical concept does not have to be continually subjected to a process of adjustment to the latest scientific and technological developments in each case.

Because of constraints present due to what has already been built, technical modifications of projects which are in the execution stage often lead to solutions different from what they would be if the goals pursued could have been incorporated in the plant's concept before the beginning of construction, with such "constrained solutions" often failing to be improvements. This means specifically that additional requirements on the plant engineering should be effected during the execution phase only when their improvement of the operational safety of the plant is a very substantial one.

Possible modifications which can be imagined from the constantly advancing level of science and technology either should be incorporated in new projects before the beginning of construction, or else should be retrofitted after the completion of the plant. The always exemplary technical level in German power-plant engineering generally--and in nuclear power plant engineering in particular--allows this manner of proceeding. This is borne out by the very degree of availability of the older nuclear power plant facilities. If this were done, it would also create the preconditions needed for separately identifying time-schedule and cost effects arising from subsequent requirements made. When the contractual basis is that of turnkey deliveries, projects which allow additional costs to accrue on the order of DM 200 million just because of 1 year of delay in the time schedule for paying financing costs are no longer manageable in a business sense.

Added to this are the costs for the missed sales proceeds for base-load electricity during the period of delay, as well as the costs which arise because of a multiplication of engineering work and finally because of increased deliveries and services in connection with the fabrication of the components, their installation, and the initial operation. Here, of course, a question arises about the reasons for the additional costs in connection with the currently practiced way of executing projects--the continual incorporation of technical modifications. Whereas the financing costs and the lost sales proceeds are relatively easy to demonstrate, difficulties arise in connection with the engineering-work expense. It is just the technically less costly solution which requires more engineering hours to work out how to get by with the lowest possible subsequent costs in connection with the hardware, installation, and operation. But it is difficult to demonstrate this conclusively, since for scheduling and cost reasons no engineer--or the company which employs him--follows up on the less suitable plan for a solution, merely in order to furnish proof of the reasonableness of the engineering-work expense. This state of affairs applies to precisely those plants which were ordered built some time around 1973, following the building of the first large plant of the 1,300-MWe output class, in the hope that the level of technology realized with this plant could be repeated in subsequent plants upon making the appropriate adaptations.

The conseqeunces of often apparently harmless rules in regulation manuals, guidelines, and standards, which then are reflected as state of the art in the requirements of the partial construction permits, often lead to unpleasant surprises in connection with projects in the process of execution. A technical concept, which surely has to have formed the basis of every nuclear power plant at the beginning, can stand only a limited number of modifications. When this limit is exceeded, there is a danger that the quality of the conception will suffer. In practice, one knows quite well what it means when a technically sophisticated construction no longer comes "from a single mold." Through too many modifications, experimental data are lost as well. The very necessity brought about by frequent modifications to keep track of the consistency of all data in the documents on licensing, construction and fabrication, installation, initial startup, and quality control has become a logistic and organizational problem, given the multilayered structure of licensing procedures--with such a problem being unforeseeable by anybody as late as in 1977. Added to this is the fact that the inherent momentum to make modifications which is assailing this plant engineering is happening against the background of judicial reviews before the administrative courts, which brings additional risks for licensee and manufacturer.

These remarks are not meant to question either the requisite certainty of the law or technical safety. On the contrary, in essence we can be proud of both. However, they are meant to show that the overlapping of various factors--the turnkey executing of a major project, consideration given to the latest level of science and technology, formal legal regulations, as well as those legal concepts which often cannot be interpreted in a fundamental way until in their application--becomes a task which is no longer executable on business grounds. And this is only because in the individual sectors maximum demands are made at all times, without heed being paid to an overall optimization. This is reflected even in technically perfected pressurized-water reactor projects, in terms of immense cost-overrun packages and time-schedule delays, which approach the limits of what is acceptable for gainful activity, not only from a management but also from a human point of view. Moreover, in connection with the prototype plants SNR-300 and THTR-300, we are demonstrating through the present course of action that this is reaching the limits of the amount of stress our economy can endure.

All of this is taking place in our country against the background of the increasing scarcity of fossil raw materials, the unavoidably increasing consumption of oil in the developing countries, and the recognized excessive dependence of our national economy on the imported energies oil and gas. On the other hand, for nuclear energy the relevant technical safety, the certainty of a supply, and its reduced polluting of the environment would seem to be sufficiently demonstrated.

If as is argued in the energy program of the Federal Government nuclear power is necessary to meet our future needs, then it is also imperative to create whatever conditions are indispensable in this country for enabling us to build as quickly as possible the requisite number of nuclear power plants, in line with not only management considerations but also those of the economy as a whole. But to that end, what is needed is not only the basic acknowledgment of "yes to nuclear energy." But also a consistent course must be set extending down to the administrative sector. In the sector of project appraisal, the consultants do not need to compete among themselves, but need instead to cooperate on matters of an essential nature, and among the operators of the plants what is needed is a readiness to adopt standardization for the industry without sacrifice of technical diversification.

However, without a clear political resolve we will not make any decisive advances in the future either. Given a clear political resolve, it is possible to find well-balanced relations for a constructive appraisal, for the administrative implementation, a standardization based on experience, and an appropriate judicial reviewability, such as to ensure that the result will be a technical and economic success.

4. Consequences?

German nuclear power plant engineering still sets an example worldwide, but already its competitiveness can be disputed. Not only is this true in relation to competition from other countries, but also it holds in relation to conventional energy sources. Any policy which would make it seem that nuclear energy was economically unnecessary in Germany because of the exaggerated demands placed on it would be a policy which would oust the FRG from its role as one of the leading industrial nations in general--and as a supplier of nuclear power plants on the international market in particular. With that, our social and economic capabilities would be called into question as well. We would surrender the quite major innovations of our generation.

With reference to the advanced reactor systems being pursued in the FRG, the consequences which a hesitant attitude can have become clear especially in light of the project for the fast breeder reactor in Kalkar. Whereas in this field the initial positions between Germany and France had been the same originally, today it can be stated that an initial sodium-cooled fast breeder plant with

1,200 MWe of output will go into operation in France in 1984, whereas in the FRG one should not anticipate any construction decision (!) for a comparable plant until toward the end of the 1990's. This is a trailing behind by the FRG of more than 10 years, following the same original starting position.

Meanwhile, the Inquiry Commission--which was appointed by the Ninth German Bundestag and which is supposed to work out a recommendation on the question of the initial startup of the SNR-300--is occupying itself with formal questions of whether the so-called "critical scientists" who are sitting on this commission can be granted a new extension of time to present their position. What is difficult to comprehend here are the declarations of policy understandings, which lead to new extensions of time and thus again endanger the arduously fabricated financing plan for the SNR-300.

In a similar way, with the high-temperature reactor there is a danger that the technical lead which we still enjoy worldwide in the utilization of high coolant temperatures is being gambled away, because due to the constant incorporation of subsequent requirements in the course of the present licensing procedure and the still pending licenses, the commissioning of the plant THTR-300 is being delayed until October 1985. With that, once again there is a threat that our advantage may be jeopardized in connection with a reactor line which should be made available as soon as possible for the realization of the projected goals of the Third Updating of the energy program--namely, energy conservation and substitutes for oil--in particular because of the favorable potentialities of this line for providing process heat. Therefore, should we not do our utmost to avoid additional requirements which are non-specific as to type in connection with the prototype plants, so as to cut down on costs by means of shortened project durations--seeing that in the case of the THTR-300 almost two thirds of these costs are generated as financing costs due to sliding prices? We really must come to realize someday how much innovative power was blocked when we come to pass in review these two prototype projects, in an area where after all we certainly do not have any superabundance of innovations to spare.

5. The Next Step

However, the crucial future step for the utilization of nuclear power in our country is to complete the fuel cycles. But in this connection one should not forget that what we have here is not a technical but a "homegrown" problem, at least as far as setting time limits is concerned. On this score, the hearing on the integrated waste-disposal center at Gorleben held in the spring of 1979 has led to the perhaps too well-defined statement of the case that indeed reprocessing "has been technically solved--but politically it is not acceptable at present." Certainly it cannot be denied that there have been many politically bold attempts to solve the problem, but on the party-politics calendar for the year--in 1982 above all--the urgency of this problem gets somewhat lost, of course. Since the boundary conditions are being politically formulated, the solution to the problem must be politically achieved as well.

Now the side responsible for plant engineering has indicated an intermediate-term alternative which involves the enlargement of the storage capacities for spent fuel assemblies at reactors, as well as a storage plan involving fuel-transport casks. Moreover, these solutions, drawn up in a short time and extending as far as documents ready to be executed, have made it possible to engage in replanning on the basis of a reprocessing concept which is no longer integreated with ultimate storage and which involves an annual throughput of 350 tons of heavy metal (HM). But since an unambiguously clear statement is lacking in the Third Updating of the energy program on the question of how much nuclear energy is needed by 1995, a debate on principles arises with practically every site discussion on a reprocessing plant of 350 tons of HM throughput. Moreover, again and again the matter at issue is whether perhaps such a facility might be superfluous after all if we would just effect an even greater utilization of coal, an even greater energy conservation, and a greater utilization of regenerative energy sources.

It is precisely in such situations that the lack of any unambiguous overall projections makes its appearance. Thus it is almost inevitable that with each site considered for a reprocessing facility, for a new nuclear power plant, or as in the Wyhl case even for a nuclear power plant duly licensed according to the regulations, the time-consuming debate on principles concerning nuclear energy must be held anew. Although all the decision-makers acknowledge the absolute necessity of nuclear power, they are setting up delays in advance through tactical and procrastinating intercessions, and thus they are adding to the cost of the capital expenditure needed for an assured energy supply, whether this is by way of too much of a dependence on the fossil energy sources, or whether it is by way of higher costs for the entire nuclear infrastructure. At the same time, what happens is that our technical lead in nuclear technology--and here quite specifically high-temperature reactor technology--is being lost as an exportable commodity.

Of what use is a public, affirmative statement on the applications for constructing the nuclear power plant units of Emsland, Biblis-C, and Isar-II, if at the same time a decree on the interpretation of Paragraph 28 of the radiation-protection regulation again checks the hoped-for stimulus? Small wonder that the prospective operators of such plants are asking themselves the question of whether it is still economically justifiable to acquire such licenses.

6. General Considerations

So, given that it is not disputed by the majority that nuclear power has an important--that is, more than a marginal--function in our country's energy supply, then one should create the preconditions needed for nuclear power plants to be efficiently built, so that nuclear power as well is made available at a reasonable price. However, what is needed for that first of all is an understanding of certain fundamental connections, and furthermore a consensus concerning the aim to be striven for. Such a fundamental connection is the one between an assured and economical energy supply on the one hand, and public security, full employment, and a high standard of living on the other. Of course, nowadays cause and effect tend to be mixed up arbitrarily, which has been demonstrated already with the example of growth rates for electricity consumption. Since the economic and energy policy are to be planned for the long term, it is completely wrong of course to pick the present situation as a standard for the future. It is precisely the present unsatisfactory, truly alarming circumstances that we want to end, after all! Thus, the only question remaining is: Who is going to begin, and with what? The calculation showing what employment effects are caused by the construction of a nuclear power plant or of a reprocessing plant has been made repeatedly, and the figures are reliable and sufficiently well-known. If we begin with a speedy buildup of nuclear power plants, we cannot go wrong! But the tenor here lies on speed!

In past years, manufacturers and operators have gone through practically a technical, administrative, and judicial purgatory, in which even their innermost weak points were burned out and in which admittedly also nasty burns were produced. All who mean well should be so purified by now that we can return again to simplified procedures, to simple and for that very reason reliable technical concepts, and--more specifically--to documentations which are technically practical. Granted that the principle is valid that technical solutions and especially modifications should be judicially reviewable through administrative courts, then for all parties concerned technical clarity is an immense advantage. Moreover, in the area of engineering this involves also the admission that soundly-based experience is better than an untested theory. Moreover this also requires that we divest the handy saying "safety before economy" of its converse conclusion, that economy in some way signifies planned insecurity.

The vehement quarrel concerning the peaceful use of nuclear power evidently has forced all parties into positions which enormously obstruct the repeatedly invoked consensus. However, if we disregard those who have an eye to quite other aims than the welfare of our society, we can find signs that we are much nearer a consensus than the scene suggests. Perhaps we are only seeking a way to manifest this consensus. To that end what is needed is an unflagging continuation of the dialogue, especially with the young generation. This dialogue must have the whole as its subject--which in essence means: One should show connections between public security and an assured energy supply, between educational policy and economic policy, between environmental protection and capabilities, just to mention only a few such connections. From its import, this means also to promote an understanding of the connection between readiness to take risks and security for the future. But in addition to all the material measures needed, for which incidentally one must have come by the money first, this security for the future requires also an increased personal social commitment, a step taken towards an active sense of community. Finally, however, this requires also courage, courage to make decisions. And as a matter of fact in the domain of politics we see heartening examples of this again and again, but certainly not often enough. And it would be desirable if the media, which after all gain to the highest degree by technical progress and by an assured electricity supply, would embrace this cause more energetically.

Let us bring to bear our often painfully acquired experiences from the past and exert ourselves for the good of our society and social order. To that end, we still have to find a consensus for the peaceful use of nuclear energy to the requisite extent. Let us be optimistic, even though time is pressing. But if this consensus fails to materialize, the shifting scene referred to at the beginning may soon turn into a tribunal sitting in judgment on our society.

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